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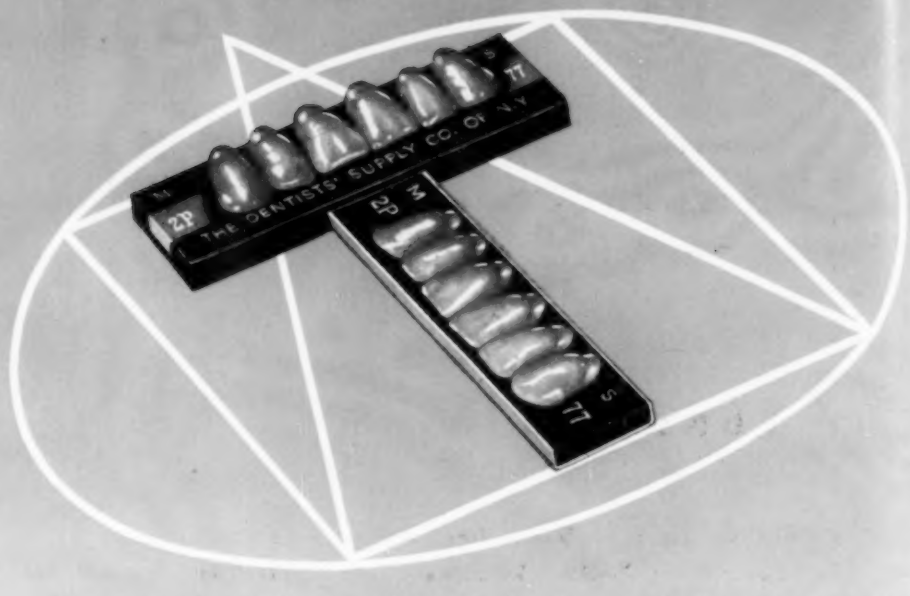

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THE Journal OF THE
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ACRYLIC RESINS: AN APPRAISAL OF THEIR USE IN DENTISTRY

Eugene W. Skinner, Ph.D., Chicago

AN ATTEMPT will be made here to evaluate the present dental use of acrylic resins in the light of the facts collected thus far, rather than to discuss detailed technics of manipulation. The point of view of the appraiser must always be taken into consideration, and in the following discussion it must be that of a researcher rather than that of a dental practitioner, because of the training of the appraiser.

In order to present a logical argument, it is necessary to define the terms used in the discussion and to circumscribe its content.

What are acrylic resins? They are all derivatives of acrylic acid. Chemical formulas indicate that there are literally millions of possible resins which might be classified as derivatives of this acid, each of which would differ in some respect from all the others. Fortunately, in the dental field one of the acrylic resins predominates, and the discussion will be confined to the polymers of methyl methacrylate.

Not all the dental resins are composed of pure polymethyl methacrylate. Some of them have been copolymerized with other resins. For example, "Vernonite" contains polyethyl methacrylate as well as polymethyl methacrylate. "Luxene 44" contains some vinyl resin in addition to polymethyl methacrylate. However, every dental resin, so far as is known at the present time, is basically polymethyl methacrylate, with additives that provide certain differences in properties, which may or may not be of clinical significance.

Polymethyl methacrylate, or dental acrylic resin, is used in dentistry for denture bases, tooth restorations of all types, artificial teeth, instruments, trays and numerous other purposes. Not long ago, if a manufacturer put *acry* into the trade name of his product, regardless of how it applied or whether it made sense, he was sure of a good sale of the product. Unfortunately, this condition still persists

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Professor of physics, Northwestern University Dental School, Chicago.

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to some extent, but the dental profession is beginning to realize that "acrylic" is not a panacea for all his troubles, and that the acrylic resins do have their limitations.

Undoubtedly, the entire dental profession will agree that methyl methacrylate resin is the best material so far invented for use as a denture base material. By far the greatest amount of dental acrylic resin is used for this purpose. Consequently, most of the discussion to follow will be devoted to denture acrylic resins, and the other uses will be mentioned only briefly.

Advantages of Acrylic Resin

Nothing yet has been found that will match the appearance of the soft tissues of the mouth with as great a fidelity as will acrylic resin. This quality alone would justify its use, regardless of its disadvantages. Not only is the acrylic denture base beautiful when it is first placed in the mouth, but the appearance is permanent, provided that the patient follows a simple routine of cleansing and general hygienic care.

The tensile and transverse strengths of the denture base acrylic resins appear to be satisfactory in general, if the proper factors of design are taken into consideration in the construction of the denture. It is true that the impact strength of the resin is rather low. A typical dental acrylic resin exhibits an impact strength of about 12 centimeter-kilograms per square centimeter.[1] The impact strength of the old vulcanite denture base material has been reported to be as high as 38 centimeter-kilograms per square centimeter.[2]

The impact strength is significant as a measure of resistance to sudden shock. In other words, if a patient accidentally drops his acrylic denture on a hard surface, it will probably fracture. However, this property cannot be taken seriously —after all, a patient is not supposed to drop his dentures any more than his eye glasses. Such appliances should not be handled carelessly.

If the denture base acrylic resin meets the requirements of the American Dental Association Specification No. 12 for Denture Base Material[3] (if it does not, it is not within the scope of this discussion), its rigidity and general permanence is assured.

Processing

The ease of processing these resins, in comparison to many industrial resins, is a decided advantage in their favor. Such a statement does not imply that processing of acrylic resins is a simple procedure. In order to judge the processing time and temperature that will yield the optimum properties of the resin, the operator must understand thoroughly the chemical and physical principles involved.

Improper mixing of the powder and liquid to the dough stage will invariably produce a pitted, weak and unsightly denture base. If the mold is not filled sufficiently, the denture base will be porous and pitted. On the other hand, if the final closure is made with the mold overfilled, the excess resin will pour out between the halves of the flask during processing, producing a thick flash and disturbing the vertical dimension. The trial closures are of extreme importance in this regard. The safest method is to start with a slight excess of resin in the mold and repeat the trial closure until no flash occurs, and then complete the final closure rapidly and under considerable pressure in order to avoid additional loss of resin from the mold. Such a procedure assumes that the edges of

1. Skinner, E. W., and Cooper, E. N., Physical Properties of Denture Resins. Part I. Curing Shrinkage and Water Sorption. *J.A.D.A.* 30:1845 (Dec.) 1943.

2. Sweeney, W. T., and Schoonover, I. C., A Progress Report on Denture Base Material (1935). *J.A.D.A.* 23:1500 (Aug.) 1936.

3. Revised American Dental Association Specification No. 12 for Denture Base Material Acrylic Resin or Mixtures of Acrylic and Other Resins. *J.A.D.A.* 29:127 (Jan.) 1942.

the flask and the plaster lands meet accurately and firmly at the time of the final closure.

Injection vs. Compression Molding

By far the greater number of dentures are processed by the compression molding method, namely, the use of a denture flask and a flask clamp as discussed in the preceding paragraph. The injection method, first applied to the processing of dentures by Pryor,[4] consists of prefilling the mold with resin dough, and then completing the filling by forcing additional resin dough into the mold under pressure through a sprue or ingate.

The injection method offers several advantages over the compression method. For example, the pressure on the denture during processing can be controlled. The tedious trial closures are eliminated, and there is greater assurance that the mold is filled properly. If the flasking has been accomplished with care and accuracy, the flash will be very slight, if present at all, and the vertical dimension of the denture will be preserved to a greater extent.

It has been suggested by at least two authorities that more processing strains occur during injection molding of dentures than during compression molding. For example, Souder and Paffenbarger stated:[5]

> If methyl methacrylate resin is processed in an injector type of flask, some internal strain may be developed. In the ordinary processing technic no appreciable amount of strain can be detected.

According to Tylman:[6]

> The use of injector type flasks to force additional material into the hot mold while the enclosed polymerized resin is still plastic, in an effort to eliminate this shrinkage, will introduce internal strain. . . . This is later released at mouth temperature, a variation in the fit of the prosthesis resulting.

Pryor[7] presented evidence that this is not the case. Schuyler and his co-workers[8] demonstrated a definite superiority, as regards lack of warpage and change in vertical dimension, in dentures processed by injection over those processed by the compression molding method. Extensive studies at Northwestern University by Cooper and Skinner,[9] Atiyyah[10] and Dahl[11] have demonstrated that the dimensional stability of the resin is little different whether injection or compression molding methods are used; if any differences existed, they favored the injection molding method.

On the basis of the facts as they appear at present, a wider use of the injection molding method for processing dentures should be encouraged, with the expectation that the vertical dimension will be better maintained and that other improvements may be effected.

Curing Shrinkage

All acrylic resins shrink during processing. The first shrinkage is brought about by the polymerization of the monomer during the curing process. A second, thermal shrinkage, is caused by the processing temperature.

Taylor[12] suggests that the polymerization shrinkage may be reduced or even eliminated by the conditions of molding. As for thermal shrinkage, a reduction can be effected if the resin possesses a low molding temperature. As the denture

4. Pryor, W. J., Methods of Producing More Lifelike Dentures. *J.A.D.A.* 28:894 (June) 1941.

5. Souder, W., and Paffenbarger, G. C., *Physical Properties of Dental Materials*. Bureau of Standards Circular C433. Washington, D. C.: U. S. Government Printing Office, 1942, p. 165.

6. Tylman, S. D., Where and How May Acrylics Be Used in Dentistry? *J.A.D.A.* 29:645 (April) 1945.

7. Pryor, W. J., Internal Strains in Denture Base Materials. *J.A.D.A.* 30:1382 (Sept. 1) 1943.

8. Schuyler, C.; Friedrich, E. G., and Vaughan, H. C., Jr., Processing Acrylic Dentures; Compression and Injection Method. *U. S. Nav. M. Bull.* 43:297 (Aug.) 1944.

9. Cooper, E. N., and Skinner, E. W., Dimensional Stability of Denture Resins. Abstract. *J. D. Res.* 22:203 (June) 1943.

10. Atiyyah, A. R., Dimensional Changes of the Acrylic Resin Denture Base. *Northwest. Univ. Bul.* 47:9 (March 3) 1947.

11. Dahl, G. S. A., Dimensional Stability of Small Cylinders of Acrylic Resin. Thesis, Northwestern University Dental School, 1946. To be published.

12. Taylor, P. B., Acrylic Resins: Their Manipulation. *J.A.D.A.* 28:373 (March) 1941.

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cools, if the resin remains soft to a low temperature it will shrink with the model. Obviously, once the resin hardens it will shrink independently of the model, and when it is removed the elastic stresses will immediately be released, and shrinkage will occur.[1]

A number of investigators have determined the linear curing shrinkage of strips of dental acrylic resin[13] or of modified denture bases without teeth.[1, 14] All these investigators agree that the specimens of resin that they studied were 0.3 to 0.5 per cent smaller in linear dimension after processing than the metal die on which they were processed. All the denture bases or facsimiles were measured across the posterior region. No difference in curing shrinkage was found whether compression or injection molding methods were employed.[1]

Water Sorption

Acrylic resins are notable for the fact that they absorb water and swell. The dental acrylic resins are no exception to this rule. When the investigators attempted to make measurements on their specimens when they were immersed in water, the results were not in agreement. In two investigations it was shown that for all practical purposes the swelling brought about by water sorption compensated for the curing shrinkage,[1, 13] whereas the third investigation showed that the swelling overcompensated for the curing shrinkage by as much as 0.65 per cent.[14]

Release of Strain

Obviously, when different studies disagree, there is some factor which has not been taken into consideration. One of the clues to the discrepancy appeared to be that one of the investigators[14] had measured curing shrinkage on denture bases cured against metal models, but the water sorption measurements were made across the posterior portions of actual dentures (processed in a commercial dental laboratory) which had been conditioned in air at a relative humidity of 32 per cent before the initial measurement. In determining curing shrinkage, none of the investigators attempted to correct their results for the differential thermal expansion between the resin and the metal model. A lack of control or consideration of such factors would undoubtedly have caused differences in the results, but these factors are not the only variables which have not been controlled.

With some dentures processed against a stone model at the Northwestern University Dental School, the results were entirely different. Sometimes the swelling in water overcompensated for the curing shrinkage, and sometimes it failed to compensate for it. An extensive study was then made of the problem. Not only were the denture bases processed against stone models, but also four "teeth" were inserted in the denture base in the form of glass rods carrying markers, so that the distances between them could be measured with a comparator microscope. The rods were placed in the positions normally occupied by the second molars and cuspids. The results were interesting in that the linear curing shrinkage varied in different parts of the denture.[10] The shrinkage was quite uniform from one denture to another when it was measured across the posterior portion by the method employed in other investigations. It was fairly constant in value across the cuspid positions, but generally less in magnitude. The anterior-posterior shrinkage, however, varied greatly from one denture to another, and it was entirely unpredictable in magnitude. These results indicate clearly that the acrylic denture base does not shrink uniformly during processing; in other words, a definite

13. Peyton, F. A., and Mann, W. R., Acrylic and Acrylic Styrene Resins. *J.A.D.A.* 29:1852 (Oct.) 1942.

14. Sweeney, W. T.; Paffenbarger, G. C., and Beall, J. R., Acrylic Resins for Dentures. *J.A.D.A.* 29:7 (Jan.) 1942.

warpage occurred to a linear magnitude of approximately 0.2 per cent.

When these experimental dentures were immersed in water at 37 C. (99 F.) for eight weeks, all the distances increased, as might be expected, but the change was not uniform. At the end of the eight week period in water, the posterior dimension failed to recover the original dimension before processing by as much as 0.3 per cent. The anterior portion more nearly expanded to the original dimension, but the general tendency was for the anterior-posterior dimensions to increase to more than the original dimensions by an average value of approximately 0.25 per cent. In other words, the over-all warpage of the denture base was approximately 0.5 per cent.

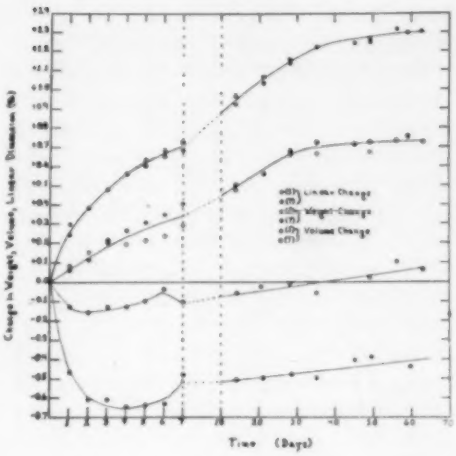

Fig. 1.—Dimensional changes of two dentures immersed in water at 37 C. (99 F.). The upper curve represents the percentage gain in weight; the next lower curve shows the percentage change in volume; the two lower curves show the percentage linear changes of the two dentures. Note the change in the time scale between seven and ten days

Porcelain Teeth and Processing Strain

Smith[15] has completed a study of the dimensional stability of experimental dentures containing an entire set of porcelain teeth. Although this work will be published in detail at a later date, a few of the results will be summarized.

Ten dentures were processed on stone models with great care, using the most exact technics known for compression molding, and using a mold lined with tin foil. In dimensions, the dentures were made to duplicate each other as precisely as possible. The linear curing shrinkage was measured across the "heel" of the dentures by the methods usually employed. The dentures were then immersed in water at 37 C. (99 F.) for six to seven weeks. The linear change in dimension across the "heels" of the dentures was measured at various intervals during this period, as was the increase in weight and volume.

The curves in Figure 1 represent typical results with two dentures processed in the same manner. The weight and volume of the two dentures increased regularly and so nearly at the same rate that a single curve could be drawn to give an average value for the increases. On the other hand, the linear change across the posterior portions of the dentures, as represented by the two lowest curves, varied so greatly in the two dentures that separate curves had to be drawn. It should be noted that a contraction of the dentures occurred in this area, followed by a slight expansion with time. Since the over-all volume expanded during this period, it must be assumed that the dentures warped in order to allow this linear contraction.

Smith further discovered that the linear curing shrinkage of the experimental dentures varied considerably. For example, the linear curing shrinkage of the two dentures used for the data presented in Figure 1 was 0.00 and 0.52 per cent respectively. The dimensional changes in water of the denture which

15. Smith, E. H., Dimensional Stability of Acrylic Resin Dentures. Thesis, Northwestern University Dental School, 1947. To be published.

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exhibited no curing shrinkage are shown in the lowest curve in Figure 1. The curve immediately above shows the dimensional change in water of the denture which exhibited a linear curing shrinkage of 0.52 per cent. These results are typical in that whenever the curing shrinkage was small, the linear contraction of the denture when it was immersed in water was large, and when the curing shrinkage was large, the initial contraction in water was less. In no case did the dentures return to their original posterior dimensions when immersed in water; the warpage in this regard varied from 0.15 to 0.72 per cent.

The rationale of these findings must be connected with the stresses and strains induced in the denture during processing. In the light of the findings of other investigators on denture bases without teeth, it must be assumed that the presence of the porcelain teeth in the denture greatly increased the strained condition. The presence of strain around the teeth was evidenced by the crazing of the resin below the posterior teeth in the experimental denture shown in Figure 2. Smith found this crazing in all the dentures studied, but it never appeared until the dentures had been immersed in water at body temperature for one to twenty-four days. So long as the dentures were kept dry, no crazing appeared. The conclusion is, of course, that the strain is released by water imbibition. This crazing cannot be seen in pink denture base resin, but it probably is present in many dentures.

Pryor[7] has demonstrated crazing in dentures similar to that shown in Figure 2, as a result of solvent action. He showed that the effect is greatly reduced or eliminated by injection molding. Smith's experiments must be repeated with injection molding under high pressures in order to study this effect further. However, it is evident that, under the conditions of the research studies outlined, acrylic dentures are not dimensionally stable. The dimensional stability is not under the control of the operator when the usual technics of processing are employed.

Clinical Significance

The greatest disadvantage, then, of the acrylic resin denture is its lack of dimensional stability. Nevertheless, thousands of acrylic dentures now in use are apparently successful from a clinical point of view. There are many failures, but it is difficult to separate the failures due to faulty technic from those which might be attributable to lack of dimensional stability of the denture.

The answer to these apparently contradictory findings of clinical evidence and laboratory measurements is that the measured warpages are tolerated by the oral tissues and apparently are not of clinical significance. In the last analysis, the final testing laboratory for a dental material is the patient's mouth. However, the acrylic dentures do warp, and if another resin can be found which is the equal of the acrylic resins in all other respects, and, in addition, exhibits better dimensional stability, common sense indicates that the situation will be improved. In other words, the present inadequacies are probably tolerated or ignored by the patient and dentist, in favor of the many ideal qualities that the denture resin possesses.

The use of acrylic resin denture materials is not to be condemned on the basis of their lack of dimensional stability. They are the best materials available at present, but they are not ideal, and we must strive continually toward perfection.

Repair and Rebasing

The release of processing strains in dentures becomes of considerable practical importance in the repair and rebasing of acrylic dentures. The processing strains are released rapidly when the dentures are heated above 75 C.

(170 F.).[9] The extensive warpage that occurs when a denture is reprocessed in boiling water was demonstrated by Tuckfield and Worner.[16] Warpage was so great in some instances that the denture would not fit the original model even grossly.

In rebasing or repairing acrylic dentures, the curing temperature must be maintained below 75 C. In order to obtain maximum strength, the curing time must be prolonged considerably at the lower temperature. The generally accepted procedure is to hold the flasked denture at a temperature of 65 to 70 C. (150 to 160 F.) for nine hours.

Acrylic Restorations

The controversy of acrylic teeth vs. porcelain teeth will not be discussed here, except to note that acrylic teeth are likely to be abraded much more rapidly than porcelain teeth. Certainly the acrylic teeth exhibit a natural appearance in the mouth, and their use appears to simplify the processing technic to a considerable degree.

The use of dental acrylic resin for the construction of inlays, crowns and bridges merits some attention.

The resin used for these restorations is pure methyl methacrylate. The powder is generally finer in particle size than that used for dentures. It is tinted by the manufacturer, and the appearance of the restorations leaves little to be desired. The technic of construction of these restorations is much simpler than for similar restorations in dental porcelain.

The lack of dimensional stability of these resins is, however, a serious drawback to their indiscriminate use for restorations. It is true that the processing strains induced in small restorations probably differ from those in denture bases. Dahl[11] attempted to study the dimensional changes that occur in small structures during immersion in water at 37 C. (99 F.). He used small cylinders of acrylic resin approximately ¼ inch in diameter and altitude. No linear measurements could be obtained accurately on such small specimens, but the volume changes were measured over a period of time during immersion in water. The typical volume changes observed were an expansion during the first four to five days, characteristically followed by a contraction for several days, and then a second expansion. In many cases, fluctuations in volume occurred during the succeeding 70 to 80 days of observation. These changes were often as much as 0.5 per cent by volume.

Changes in shape of a denture during use may not be manifested clinically to any extent, because of the flexibility of the soft tissues. However, when the resin is seated against hard tissue, such fluctuations and warpages cannot be compensated, and it is difficult to understand how the marginal seal or the cementation can be preserved under these circumstances.

Dahl offered a partial solution of this difficulty. He found that if the cylinders were molded by the injection method under heavy pressure, the contraction in volume after the first expansion was virtually eliminated, and the subsequent fluctuations in volume were greatly re-

16. Tuckfield, W. J., and Worner, H. K., Acrylic Resins in Dentistry. Part II. Their Use for Denture Construction. *Austral. J. Den.* 47:1 (March) 1943.

Fig. 2.—Crazing caused by relief of strain in an experimental denture

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duced. This finding substantiates similar observations of Pryor[7] concerning release of strain in dentures. However, the increased pressure did not reduce appreciably the curing shrinkage of the specimens.

A general appraisal of the use of acrylic resin for tooth restorative purposes is given elsewhere,[17] and need not be repeated in detail here. In brief, when the physical properties of an acrylic inlay are compared with those of a gold inlay, the comparison is decidedly detrimental to the acrylic inlay. The casting shrinkage of the gold inlay is compensated for in the casting procedure, but the acrylic inlay shrinks an unpredictable amount, with no compensation attempted. The gold inlay is dimensionally stable after it is placed, but the acrylic inlay is not. The gold inlay is capable of resisting considerable impact force during mastication by virtue of its high resilience, but the acrylic inlay possesses low resilience under these conditions. The tensile strength of the acrylic resin is approximately equal to that of 24-carat gold, and its surface hardness is less. Pure gold is generally considered to be too soft and weak for use as an inlay. The abrasion resistance of acrylic resin is less than that of gold.

In the light of these comparisons, it is evident that the indications for use of acrylic resin tooth restorations must be considered very carefully by the dentist. When acrylic restorations are used, metal backings and reinforcements should be supplied as a prevention against leakage, distortion and fracture.

Summary

An appraisal of the use of polymethyl methacrylate resins in dentistry has been made from a consideration of their physical properties and processing methods. Particular attention was given to their use as denture base materials, with the following conclusions:

1. Denture acrylic resins are the best materials thus far developed for the construction of denture bases, particularly from the point of view of esthetics.

2. Although the processing of an acrylic denture appears to be simple, a complete understanding of the chemical and physical principles involved is essential if the best results are expected.

3. The injection method of processing a denture offers several advantages over the usual compression method, in that the pressure on the resin is under control and the mold space is properly filled with resin. As a result, the vertical dimension is preserved more accurately.

4. The acrylic denture is not dimensionally stable, as evidenced by erratic curing shrinkages and release of strain during immersion in water. Both of these factors result in warpage of the denture base, and they are not controllable by the usual technics employed.

5. The observed warpage of the acrylic denture base is ignored or tolerated clinically, and it is not of clinical significance under present standards. However, the invention of a new resin with other properties equal to those of denture acrylic resin, but with greater dimensional stability, would undoubtedly raise clinical standards and improve the situation.

6. In order to prevent warpage, repairs and rebases should be processed at a temperature less than 75 C. (170 F.).

The use of acrylic resin for tooth restorations was discussed briefly. It was concluded that the indications for such use must be considered carefully by the dentist because of the lack of dimensional stability of acrylic resin and other disadvantageous properties.—*311 East Chicago Avenue.*

17. Skinner, E. W., *The Science of Dental Materials*, ed. 4. Philadelphia: W. B. Saunders Company, 1946, p. 337.

A STUDY OF THE TONGUE AND ITS RELATION TO DENTURE STABILITY

C. R. Wright,* D.D.S., M.S.; John H. Muyskens,† Sc.D., L.H.D.; Leon H. Strong,‡ Ph.D.; Kenneth N. Westerman,§ Sc.D.; R. H. Kingery,** D.D.S., B.S., and S. T. Williams,†† D.D.S., M.S.

It has long been an accepted fact that the tongue plays an important role in stabilizing mandibular dentures. Observation has indicated that stability or lack of stability was in many cases directly associated with tongue position. Further investigation has shown that the tongue has a normal and a retracted position in relation to the teeth, and that the retracted position is unfavorable for stability in mandibular dentures.

As a result of studies conducted by this group, it is now possible to make certain definite statements. In the investigation these methods of approach were employed: (1) a study of the gross movements of the soft tissues, by means of slow motion pictures; (2) experiments with edentulous mouths in a fixed and varying vertical dimension; (3) a comparison of measurements of natural dentitions with complete dentures; (4) observations of the living tongue in function and an anatomic analysis of its function. Obviously, the scope of this introductory paper does not permit a full report of the observations made in each of the named divisions. Supplemental discussions will be issued later which will attempt to verify the brief and somewhat categoric statements made in this report.

Repeated observations of motion pictures of the mouth in function reveal that the soft structures surrounding natural dentitions not only have intimate contact with them, but also must have a fixed relationship to permit harmonious coordination. Mouths with natural dentitions are unable to carry out normal functions if the apex of the tongue is removed. Chewing is impossible on the side of a mouth on which the buccinator muscle has been denervated. It is evident that the hard parts are not the sole determinants of function.

In any practice denture patients fall into two groups; those who are successful in using their dentures and those who are not. In both groups all types of mouths and behavior conditions are represented. In many cases the failure of adjustment to dentures undoubtedly is due to poor construction or workmanship. However, it is also true that in many mouths having well made dentures, effective adjustment is extremely slow and with some patients it is impossible. Those who make an effective adjustment within a short time are classified as having the "knack" (functional ability). It appears that much of this so-called knack is concerned with the function of the tongue.

To determine the normal position of the tongue it was necessary to study mouths with natural dentitions. This was done on patients who had what are

*Associate professor of prosthetics, University of Michigan, Ann Arbor, Mich.

†Associate professor of phonetics, University of Michigan, Ann Arbor, Mich.

‡Associate professor of anatomy, Chicago Medical School, Chicago, Ill.

§Voice scientist, Ann Arbor, Mich.

**Professor of prosthetics, University of Michigan, Ann Arbor, Mich.

††Professor of prosthetics, Washington University, St. Louis, Mo.

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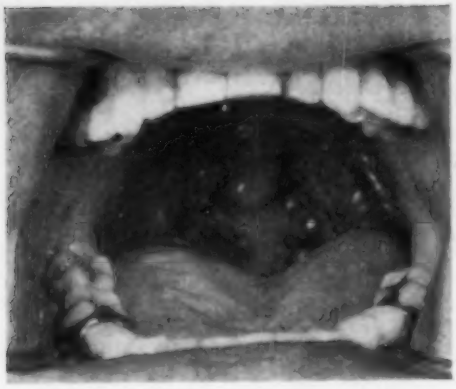

Fig. 1.—Showing left-sided swallowing groove (bolus groove)

termed average dentitions for their particular age group. Each patient's tongue was examined in repose and in function, and these observations were made:

1. Relation of the apex of the tongue to the mandibular teeth when in repose.
2. Function of the tongue and the teeth during incising.
3. The right side or left side habits of chewing.
4. The right side, left side (Fig. 1) and centric swallowing as seen in the bolus groove appearing in the pronunciation of (i, e, a).[1]
   a. Chewing on one side and swallowing on the other.
   b. Chewing and swallowing on the same side.
   c. Swallowing in the center.
   d. Right and left-sided habits of swallowing in individuals who have no swallowing groove.
5. The type of palatine vaults in relation to the foregoing chewing and swallowing habits.

From the foregoing observations it was found that in 65 per cent of cases the normal position of the tongue is a position in which it lies completely lax in the floor of the mouth, the apex slightly below the incisal edges of the mandibular incisors (Fig. 2, *A*) and the dorsum visible above the teeth in all parts of the mouth. The tongue is so free from contraction of any kind that it is practically fluid in its ability to fill all irregularities of the teeth both anteriorly and laterally along all its borders.

It was also noted that in the normal position some tongues appear to assume a low level and some a high level (Fig. 2, *B*). In the low level the lateral borders rest against the lingual surfaces of the lower posterior teeth, while in the high level the lateral borders are above the occlusal surfaces of the mandibular posterior teeth and in many instances show the imprints of the lingual surfaces of the maxillary posterior teeth (Fig. 2, *C*). Drawings of the high and low levels are shown in figure 2, *D* and *E*.

From this normal position the tongue can easily act in apposition to the buccinator muscle of either cheek in the act of chewing. In the patients in which this normal position did not occur (35 per cent) it is interesting to note that in the majority there were missing or malpositioned teeth, dentures or malformations of the arches or vaults.

The normal habit of chewing seems to be that right-sided chewers are left-sided swallowers, and that left-sided chewers are right-sided swallowers. In patients where exceptions to this rule occurred, the exceptions appeared to be associated with the same irregularities which destroyed the normal position of the tongue.

The abnormal position of the tongue, seen in 35 per cent of the patients, is a retracted position. These retractions occur in four different forms:

1. A retraction by which the apex of the tongue curls downward from the

1. The bracketed vowels are phonetic symbols, each standing for a single sound; i(e), e (a), a (a).

mandibular incisors and dorsally along the frenulum, while the radix of the tongue is elevated (Fig. 3, $A^{1,2}$).

2. The apex seems to disappear into the body of the tongue and give it a squared appearance (Fig. 3, $B^{1,2}$).

3. The apex of the tongue curls upward and dorsally from the mandibular incisors (Fig. 3, $C^{1,2}$).

4. The body of the tongue is depressed into the floor of the mouth moving the entire mass dorsally (Fig. 3, $D^{1,2}$).

Action of the Tongue

The muscle actions of normal chewing and swallowing in these retractile positions are highly important in denture prosthesis. Observations have shown that the food is received on the dorsum of the tongue somewhat below the incisal plane of the mandibular incisor teeth (Fig. 4, *A*). As the tongue comes forward to contact the food the center of it, just dorsal to the apex, contacts the maxillary incisors on their lingual surfaces and the palate immediately above them.

After the reception of food, the tongue shifts the food to either side for mastication, placing it between the teeth. In so doing, the opposite side of the radix of the corpus and dorsum of the tongue is elevated so that its lateral border is above the occlusal surfaces of one half, or more, of the molars. In doing this, it

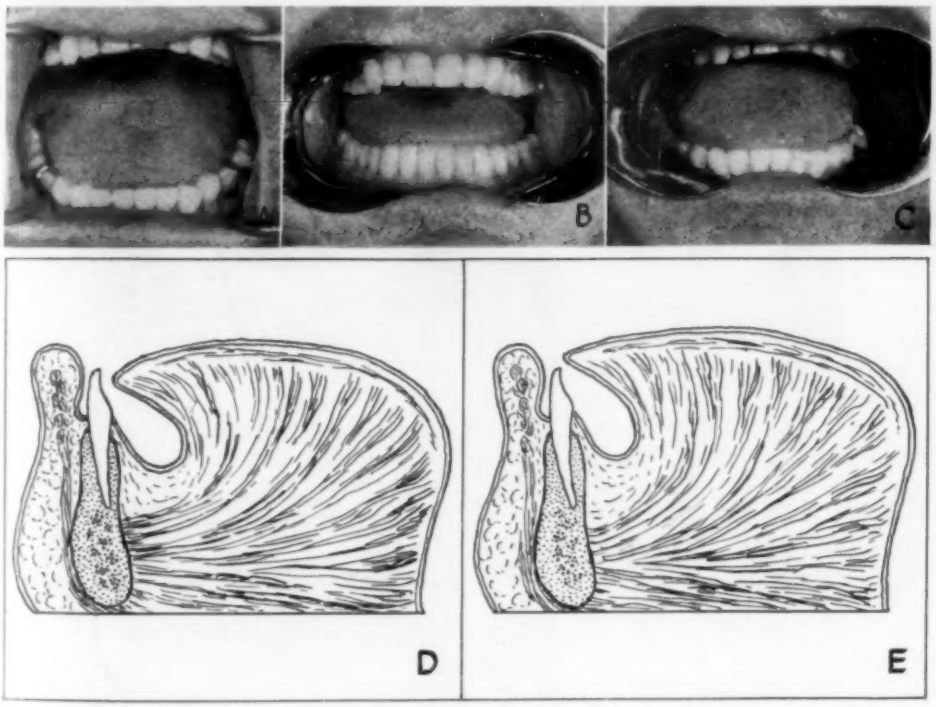

Fig. 2.—A: Normal tongue position in the low level. B: Normal tongue position in the high level. C: Normal position of the tongue in the high level with imprints of the lingual surfaces of the maxillary posterior teeth. D: Drawing of the tongue position in the low level. E: Drawing of the tongue position in the high level

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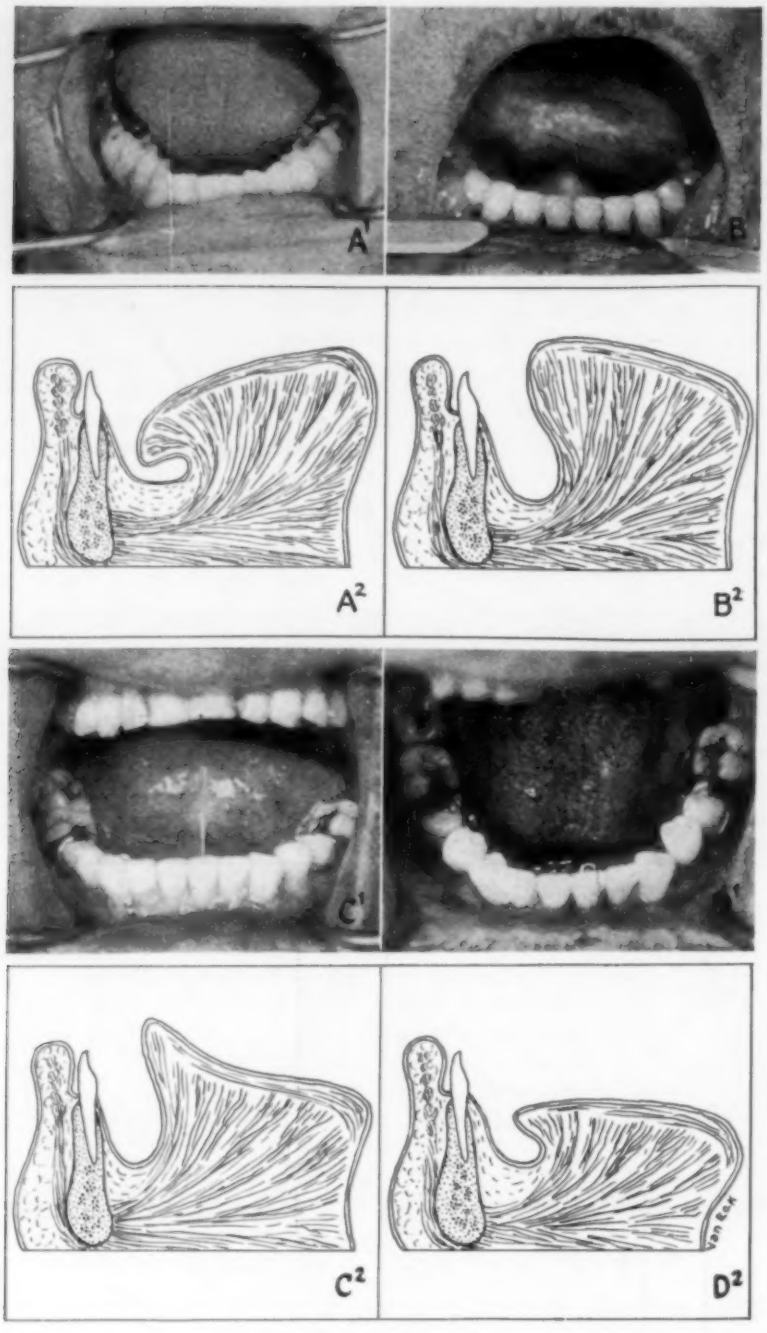

Fig. 3.—A¹: The apex of the tongue curls downward and the radix is elevated. A²: Drawing of A¹. B¹: The apex seems to disappear into the body of the tongue and give it a squared appearance. B²: Drawing of B¹. C¹: The apex of the tongue curls upward and dorsally from the mandibular incisors. C²: Drawing of C¹. D¹: The body of the tongue is depressed into the floor of the mouth moving the entire mass dorsally. D²: Drawing of D¹

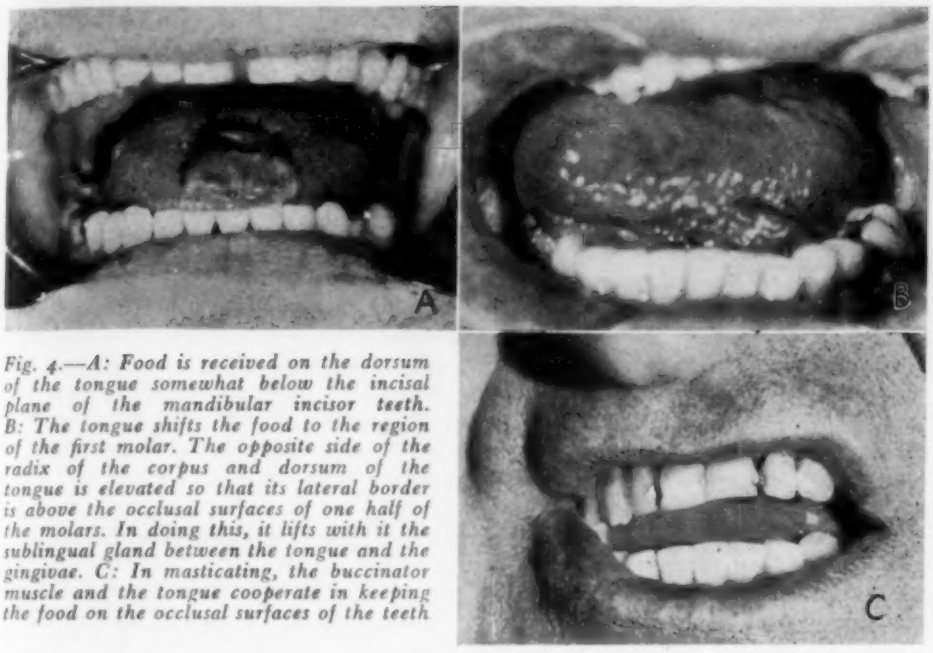

Fig. 4.—A: Food is received on the dorsum of the tongue somewhat below the incisal plane of the mandibular incisor teeth. B: The tongue shifts the food to the region of the first molar. The opposite side of the radix of the corpus and dorsum of the tongue is elevated so that its lateral border is above the occlusal surfaces of one half of the molars. In doing this, it lifts with it the sublingual gland between the tongue and the gingivae. C: In masticating, the buccinator muscle and the tongue cooperate in keeping the food on the occlusal surfaces of the teeth

lifts with it the sublingual gland, in contact with the epithelium of the mouth, between the tongue and the gingivae (Fig. 4, *B*).

When the food is thrust upon the occlusal surfaces of the teeth for mastication, it is impeded from falling into the vestibule by the buccinator muscle. Certain fibers of the buccinator muscle, from the angle of the mouth dorsally, form a medially projecting roll against the buccal surfaces of the teeth which crowds the interstices of the teeth and, should one be lacking, contacts the tongue.

In masticating, the buccinator muscle and the tongue cooperate in keeping the food on the occlusal surfaces of the teeth. As chewing proceeds, a slow backward movement of the chewed food takes place by a sort of slow peristalsis of the buccinator muscle and of the tongue (Fig. 4, *C*).

In mouths in which the food is chewed predominantly on the right or left side, there is ordinarily a tonically contracted area on the opposite side of the posterior part of the dorsum of the tongue just above the radix. This tonic contraction leaves a depression or furrow which is designated the swallowing groove (Fig. 1). Since the radix of the tongue contacts the velum during chewing, the bolus of food is projected across the mid part of the dorsum to the opposite side of the center of the tongue before swallowing. This action comes about because one swallows as a continuous process after chewing without any distinct break. Therefore, the bolus of food has more room on the opposite side of the mouth since the contact of the lateral border of the tongue against the food in process of chewing is tonic (in a state of contraction). This tonic state lends itself less to groove formation than the less active opposite and posterior part of the dorsum.

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The high specialization of the musculature of the tongue makes necessary a more precise analysis of its functional components than is given in anatomic textbooks. A critical, and in places a microanalytic, study is necessary. Such a study thus far does not appear in the anatomic literature, since only gross muscle pull has been dealt with.

The apex of the tongue is the most specific and fastest moving musculature of the human body. It has the ability to make consonants at the rate of 1/200 of a second. In 100,000 words of random conversation, 60 to 80 per cent of these speech contacts lie in the anterior tip of the tongue. The sensitivity of the apex of the tongue is necessary for the extreme accuracy of its various functions. If restrictions or constrictions occur in the anterior arrangement of teeth, a retractile tongue position may result.

To illustrate the possibility of the occurrence of these restrictions and constrictions, measurements and observations of natural dentitions were made and compared with similar measurements and observations of complete dentures (Fig. 5).

While the averages show little differences in the measurements between natural dentitions and complete dentures, it clearly illustrates how tongue space may be influenced by improper positioning of the teeth in the complete denture. There is approximately a 5 mm. difference in the lingual transverse width of the first and second bicuspids. This would indicate that teeth set in the complete denture, if posterior to the position of the patient's natural teeth, would find the first bicuspid approaching the position formerly occupied by the natural second bicuspid. Such a displacement would cause a loss of 5 mm. of width in the region of the first bicuspids and the tongue would be deprived of approximately 1,000 cu. mm. of area for normal functioning. This would be a factor in causing tongues to retract.

Conclusion

1. The tongue has a natural or optimum position during rest and while in function.

2. The level of the natural or optimum position of the tongue (as seen in 65 per cent) seems to be controlled by the vault of the maxilla. This accounts for the fact that many tongues have a relatively high plane of function.

3. Some tongues (as seen in 35 per cent) have an awkward or retracted position in rest and during function. The retracted type of tongue is very unde-

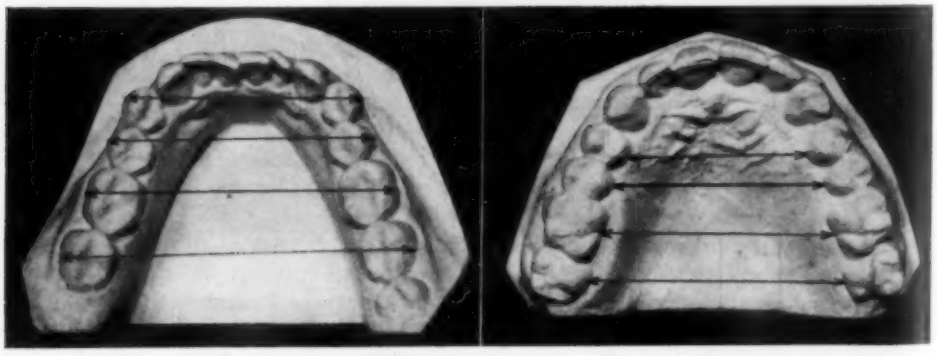

Fig. 5.—Showing points used for the buccal and lingual measurements

sirable for stability of a lower denture.

4. Tongues vary in sensitivity, and those extremely sensitive many times will become retracted following the insertion of a prosthetic appliance.

5. Many tongues that appear awkward or retracted in denture patients are, in reality, normal tongues, but constrictions or restrictions have made it impossible for them to function normally.

6. Recognition of tongue position will aid the dentist in determining the degree of success or failure a patient will have in adjusting himself to dentures. The tongue position obviously is a part of the "knack" that many patients possess in their adjustment to dentures.

7. Retracted tongue positions may be improved by: (*a*) illustrated instruction to patients; (*b*) use of a series of exercises designed for each type of retraction.

Methods of correcting tongue retraction for the improvement of denture stabilization will be outlined in a subsequent paper.

STUDIES OF TOOTH SURFACE STRUCTURE BY OPTICAL AND ELECTRON MICROSCOPY

David B. Scott,* D.D.S., and Ralph W. G. Wyckoff,† Ph.D., Bethesda, Md.

PRESENT-DAY knowledge of the histologic structure of enamel and the various theories regarding its disintegration in caries have been derived almost entirely from the study of ground and decalcified sections cut perpendicular to the tooth surfaces. Until recently little has been known about the microstructure and properties of the outer enamel surface. This has been due largely to the lack of adequate technics for surface studies. Sectioning methods cannot be employed because of the curvature of the tooth surfaces and the inability to observe details accurately on the surfaces of ground sections by transmitted light. A few observations have been made with reflection-type microscopes,[1, 2] but the method is of limited value, mainly because of the surface contours.

With the advent of replica technics, it has become apparent that much can be learned about the structure of tooth surfaces which not only will provide basic histologic information, but may also throw new light on the nature of the destructive processes involved in caries. The methods are also well adapted to studies of the effects of chemical agents, dentifrices and abrasives on tooth structure. Various materials have been used for preparing replicas of tooth surfaces. Wolf[3] has used an adhesive plastic tape

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*Dental surgeon, U.S.P.H.S., National Institute of Dental Research, National Institutes of Health, Bethesda 14, Md.

†Scientist director, U.S.P.H.S., Laboratory of Physical Biology, Experimental Biology and Medicine Institute, National Institutes of Health, Bethesda 14, Md.

1. Pickerell, H. P., *The Prevention of Dental Caries and Oral Sepsis*. London: Balliere, Tindall and Cox, 1912, pp. 49-90.

2. Eisenberg, M. J., A Microscopic Study of the Surface Enamel of Human Teeth. *Anat. Rec.* 71:221 (June) 1938.

3. Wolf, J., Plastische Histologie der Zahngewebe. *D. Zahn- Mund- und Kieferheilk.* 7:18 (May) 1940.

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and studied the resulting replicas with an optical microscope, using transmitted and reflected light. Gerould[4, 5] has examined polystyrene-silica replicas with the electron microscope. The present paper will describe some of our findings through optical and electron microscopy of metal-shadowed collodion replicas.

Early in the investigations it was found that there are large amounts of structure on tooth surfaces visible at low magnifications, and that there is considerable variation in structure in different areas on the surfaces. It has, therefore, been necessary to study thoroughly the character of tooth surfaces at the lower magnifications afforded by the optical microscope before proceeding to the electron microscope. While the latter instrument affords high magnification, the areas which can be observed are necessarily small and the difficulties in identifying and interpreting the structures observed make such preliminary studies invaluable.

The preparation of metal-shadowed collodion replicas for optical microscopy has been described in detail previously.[6] In brief, it consists of covering the prepared surface of an extracted tooth or a tooth *in situ* with a collodion-amyl acetate-ether mixture, allowing it to dry and stripping off the thin film which is formed. The topographic detail on the surface is thus reproduced on the replica in reverse; depressions in the surface appear as elevations on the replica and vice versa. The replica is next placed face up on a glass microscope slide and shadowed in a vacuum chamber according to standard technics. The specimen is placed below and in front of a wire filament containing a small amount of metal, in this case silver, which is then heated until the metal evaporates. A thin layer of metal is thus deposited obliquely on the surface of the replica, and shadows are cast by the elevations which stand in its path. By shadowing, the microscopic detail on the replica, which is otherwise difficult to observe with transmitted light, is brought into pronounced tridimensional relief.

The first studies of about 2,500 replicas[6, 7] provided much information regarding the types of detail to be found on tooth surfaces. The structures observed included enamel rod-ends, perikymata, cracks and representations of various developmental and acquired defects. Subsequent studies[8] have revealed additional structures, such as a band of irregularly shaped depressions near the cementoenamel junction and surface stratification, about which little is yet known.

Marked variations were noted in the appearance and distribution of the structures observed on surfaces, and attempts at classification were unsuccessful until it was found that these variations are a function of the age of the tooth. In a study[8] of 1,239 replicas made from 639 teeth from individuals of known age, it was possible to deduce the changes which occur on tooth surfaces with advancing age. The surfaces of unerupted and recently erupted teeth are completely covered with pronounced perikymata and enamel rod-ends. Cracks are seen on almost all surfaces and small amounts of stratification on about half. The most striking change which takes place with age is a gradual wearing away of the perikymata and rod-ends; the number and distribution of cracks remain constant, and the stratification disappears very quickly.

In all cases the pattern of wear appears similar. The enamel rod-ends at the crests between the perikymata at the highest contours and most accessible regions of

4. Gerould, C. H., Ultra Microstructures of the Human Tooth as Revealed by the Electron Microscope. *J. D. Res.* 23:239 (Aug.) 1944.

5. Gerould, C. H., Electron Microscope Study of the Mechanism of Fluorine Deposition in Teeth. *J. D. Res.* 24:223 (Oct.) 1945.

6. Scott, D. B., and Wyckoff, R. W. G., Shadowed Replicas of Tooth Surfaces. *Pub. Health Rep.* 61:697 (May) 1946.

7. Scott, D. B., and Wyckoff, R. W. G., Typical Structures on Replicas of Apparently Intact Tooth Surfaces. *Pub. Health Rep.* 61:1397 (Sept.) 1946.

8. Scott, D. B.; Kaplan, H., and Wyckoff, R. W. G., Replica Studies of Changes in Tooth Surfaces With Age. *J. D. Res.* 28:31 (Feb.) 1949.

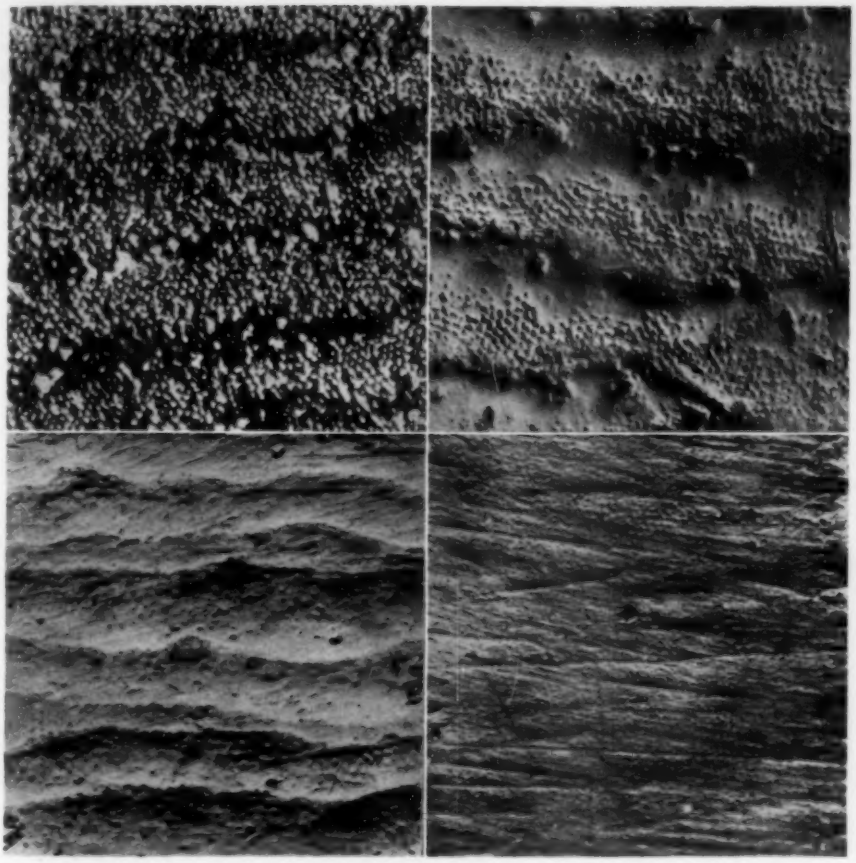

Fig. 1.—Progressive stages in the loss of structural detail on tooth surfaces. (150X). Above, left: Intact surface, showing pronounced structure. Above, right: Rod-ends lost in regions between perikymata. Below, left: Most of rod-ends lost, perikymata faint. Below, right: Structural detail almost completely lost

the surfaces disappear first, followed by further generalized loss of rod-ends, a less rapid flattening of the perikymata, and finally disappearance of the perikymata themselves (Fig. 1). The rate at which surface structure is lost appears to be related both to the location of the surface on the tooth and to the location of the tooth in the mouth. Proximal surfaces of all teeth retain their structural detail much longer than do labial, buccal and lingual surfaces. This is shown in Figure 2, in which the surfaces of teeth from individuals of different ages are compared with surfaces of unerupted or recently erupted teeth. In the study, surfaces were grouped into four arbitrary categories according to prominence and quantity of structure—*pronounced, medium, faint* and *absent;* in the graph the percentages of labial-buccal and proximal surfaces falling into the first two classes are plotted against age. In addition, it was found that the surfaces of molars and

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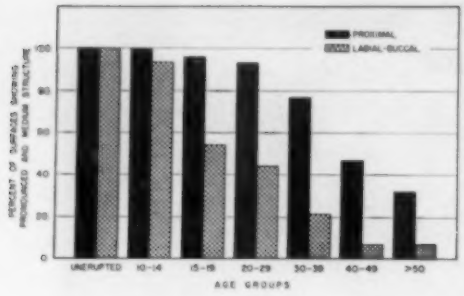

Fig. 2.—Comparative amounts of structure on proximal and labial-buccal surfaces of teeth grouped according to age of individual

bicuspids retain their structural detail considerably longer than those of incisors and cuspids.

The availability of unerupted teeth and teeth of known age has afforded an opportunity to study the relation between enamel cuticle and the structures visualized on surface replicas.[5] As would be expected, it was possible to isolate cuticle by immersing unerupted and recently erupted teeth in acid. Since the surfaces of these teeth show pronounced patterns of perikymata and enamel rod-ends, the question arose as to whether these structures are found only in the cuticle or represent structures on the enamel surface to which a thin membrane has been closely adapted. When pieces of cuticle were shadowed in the same manner as the replicas, the structural details observed resembled closely those seen on replicas taken from the surface before removal of the cuticle. However, after acid treatment the surfaces were so deeply etched that it was impossible to determine the character of the surface immediately beneath the cuticle. To date attempts to remove cuticle with nonacid agents have not been successful. Until some means of studying the intact enamel surface beneath cuticle is found, its structural characteristics cannot be determined. It does appear, however, that whenever pronounced patterns of perikymata and rod-ends, resembling those seen on surfaces of unerupted or recently erupted teeth, are observed on surfaces of older teeth, cuticle is present. It has been demonstrated that cuticle can be floated from such surfaces. The observations that pronounced structural detail remains for a few years on most surfaces, and persists for long periods of time on proximal surfaces and on the surfaces of posterior teeth suggest that cuticle should not be considered entirely as a transitory structure of little or no significance.

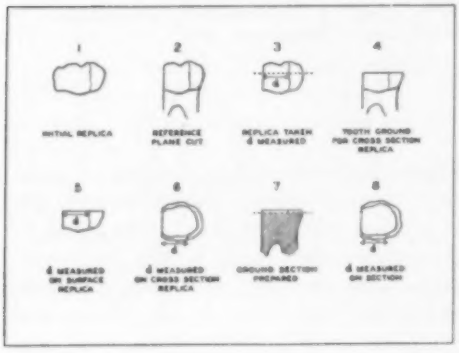

Fig. 3.—Steps in technic used to demonstrate the coincidence of cracks observed on replicas of tooth surfaces with the outer edges of lamellae observed in ground sections. (d, distance from reference plane to crack or lamella)

The term "cracks" has heretofore been used arbitrarily to describe the narrow fissures, running parallel to the long axis of the tooth, which are observed on most surfaces.[6-8] It appears that these structures are formed during development of the tooth and that they are not due to damage in handling, for they are observed both on replicas taken from surfaces of teeth *in situ* and on those taken from surfaces of extracted teeth.[7] There is little difference in their appearance, number and distribution on the surfaces of unerupted teeth and erupted teeth of various ages.[8] Cracks appear to originate at the cemento-enamel junction and extend

for varying distances across the surface. The majority are seldom more than a millimeter in length, while a small number run all the way to the incisal or occlusal edge of the surface. The fact that no other structures on surfaces have been observed which might represent the outer edges of lamellae, and the close resemblance of the distribution pattern of cracks on the surfaces to that of lamellae in transverse ground sections cut in different regions of the crown,[9, 10] suggest that cracks may actually be the surface manifestations of lamellae. Studies have just been completed which indicate that this interpretation is probably correct.

The procedure used to demonstrate the

9. Churchill, H. R., *Meyer's Normal Histology and Histogenesis of the Human Teeth and Associated Parts.* Philadelphia: J. B. Lippincott Company, 1935, p. 35.
10. Gottlieb, B., *Dental Caries.* Philadelphia: Lea and Febiger, 1947.

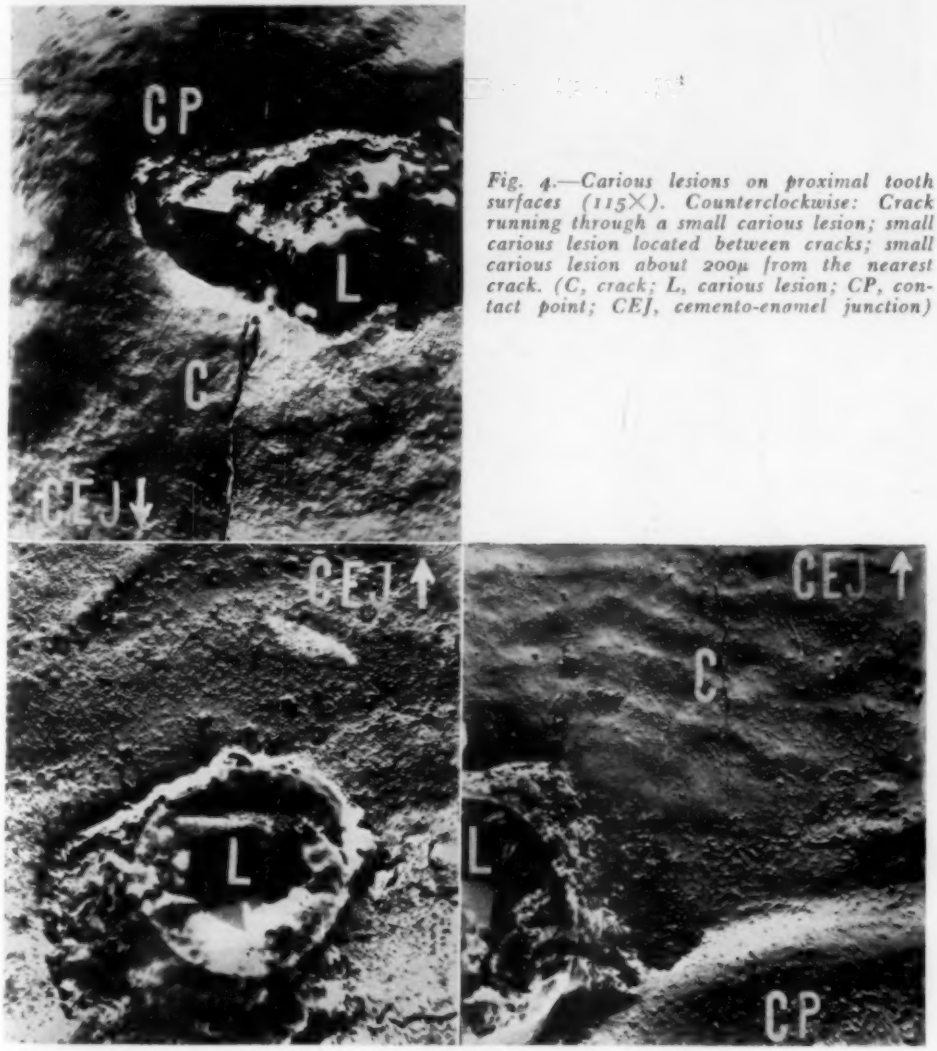

Fig. 4.—Carious lesions on proximal tooth surfaces (115×). Counterclockwise: Crack running through a small carious lesion; small carious lesion located between cracks; small carious lesion about 200μ from the nearest crack. (C, crack; L, carious lesion; CP, contact point; CEJ, cemento-enamel junction)

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Fig. 5.—Enamel rod-ends on the buccal surface of a young molar (7,500 ×)

coincidence of cracks on surfaces with the outer edges of lamellae is shown diagramatically in Figure 3. In order to show this relation it was necessary to compare the distances from a common reference point to a crack on a tooth surface and to a lamella in a transverse ground section.

Cracks were first located and identified on a preliminary replica of a surface (Fig. 3, part 1). A surface perpendicular to the one being studied was then ground flat, producing a reference plane (Fig. 3, part 2). Another surface replica was taken to record the relation of the reference plane to the otherwise intact surface, and to aid in determining the point to which the crown should be ground transversely (Fig. 3, part 3). The crown was next ground transversely to the desired level, and the cut surface was polished and etched according to a technic previously described[11] for preparation of ground sections for replicas (Fig. 3, part 4). Replicas were then taken of the remaining outer enamel surface and the etched transversely-ground surface. The distance from the common reference plane to the crack was measured on the surface replica (Fig. 3, part 5), and from the reference plane to the lamella on the ground section replica (Fig. 3, part 6). Finally, as an added check, a standard ground section was completed by grinding from the root toward the previously cut surface (Fig. 3, part 7). The distance from the reference plane to the lamella was then measured (Fig. 3, part 8).

In a series of 100 teeth studied by this method it was found that all the distances measured were equal, and thus it appears that the so-called "cracks" on the

11. Scott, D. B., and Wyckoff, R. W. G., Shadowed Replicas of Ground Sections Through Teeth. *Pub. Health Rep.* 62:422 (March) 1947.

tooth surface actually represent the outer edges of the lamellae.

The fact that lamellae are considered by some[10] to be the sites of initial invasion in caries has prompted a study of the relation between cracks and carious lesions on tooth surfaces. The distribution of cracks on carious surfaces does not differ from that on noncarious surfaces, and is such that cavities involving large surface areas inevitably cross one or more cracks. It was therefore necessary to select for examination carious surfaces which showed very small lesions. Replicas of about 300 such surfaces have been studied, and it has been found that only about half of the cavities involve cracks, while the other half are located between cracks. The cracks which run through carious lesions may cross any part of the carious area (Fig. 4, above left). Often cracks do not pass through discrete cavities, but through the decalcified areas which sometimes surround the cavities. The carious lesions which do not involve cracks may be located in any area between cracks. Figure 4, below left, shows such a cavity, which was so far from the nearest crack that it could not be included in the photographic field, while Figure 4, below right, shows a cavity about 200 μ from a crack. It thus appears to be by chance that cracks are involved by caries. If cracks are in fact the surface manifestations of lamellae, as the foregoing data suggest, the hypothesis that lamellae are the sites of initial attack in caries is subject to question, and the explanation of the carious process on the basis that these are the routes through

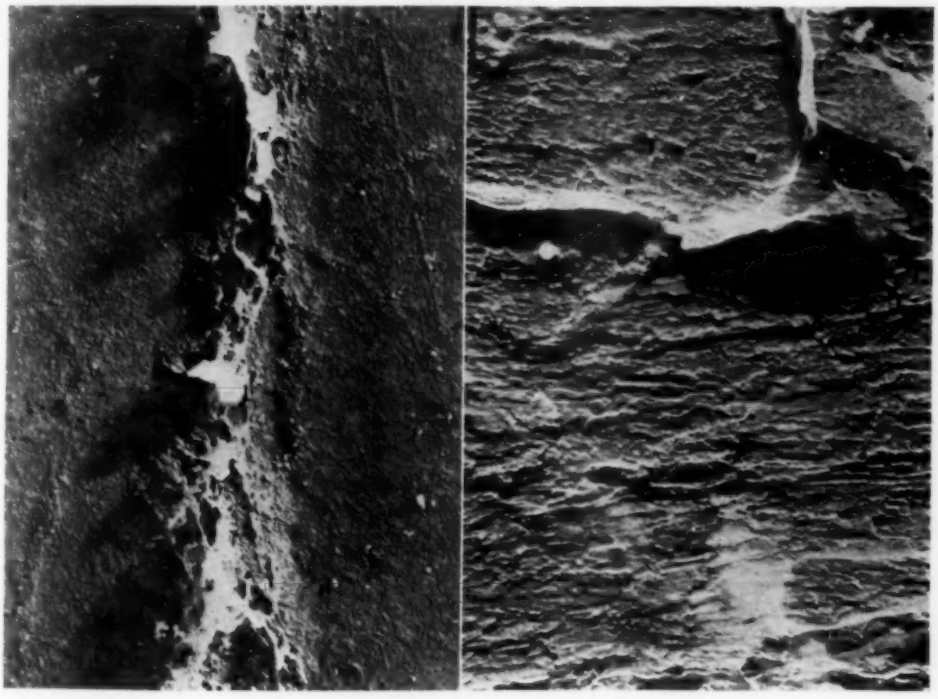

Fig. 6.—Left: Small crack on the buccal surface of a young molar. Right: Unidentified structures often observed on replicas of surfaces of unerupted and recently erupted teeth (10,000 ×)

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Fig. 7.—Typical appearance of surfaces of old teeth (7,500 ×)

which invasion occurs does not seem adequate.

The study of tooth surfaces by optical microscopy of shadowed replicas has afforded much information which is essential for selection of specimens for electron microscopy and for interpretation of the structures observed. Preliminary replicas of surfaces are always observed with the optical microscope before preparation of replicas for electron microscopy. The method of preparing shadowed replicas for electron microscopy has been described previously,[12] and is similar to that used for making replicas for optical microscopy. The principal difference in technic is that a replica for electron microscopy must be so thin that it cannot be stripped from the tooth surface manually. Therefore a slab of enamel about a millimeter thick, one surface of which is the tooth surface itself, is cut from the tooth. Collodion is applied to the still intact tooth surface, and the slab is dissolved away by flotation in acid and pepsin solutions. The replica is then picked up and shadowed in the usual manner.

Figures 5 to 7 are electron micrographs illustrating some of the details visible at higher magnifications. Enamel rod-ends on the surface of a young tooth are shown in Figure 5, a small crack in Figure 6, left, and some of the as yet unidentified structures in Figure 6, right. Figure 7 shows the typical appearance of the surface of an old tooth. Because of the absence of structural detail on the surfaces of old teeth, most studies of surfaces will be carried out on young teeth. Their study should be rewarding both for a better understanding of the structures present and because caries is a disease primarily associated with the teeth of young persons.

12. Scott, D. B., and Wyckoff, R. W. G., Electron Microscopy of Tooth Structure by the Shadowed Collodion Replica Method. *Pub. Health Rep.* 42:1513 (Oct.) 1947.

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United Nations International Children's Emergency Fund.—The 26-nation executive board of the United Nations International Children's Emergency Fund met in Paris on June 27 to make plans to carry the Fund's operations through June 1950. The United States has appropriated a total of $100,000,000 toward the Fund which must be matched by other governments on the basis of $2.57 U. S. money for every $1 from other sources. Approximately $40,000,000 is still available from the U. S. if the other governments contribute $16,000,000, which amounts would carry the Fund through the year 1949-50. The Fund is currently feeding or partially feeding 4½ million children in Europe, and in addition supplying medical supplies and assistance to children in Europe, Southeast Asia, and the Far East.—*Pub. Health Nursing 41:377, July 1949.*

AN INVESTIGATION OF DIAFIL, A DENTAL SILICATE CEMENT

George C. Paffenbarger,* D.D.S.; Aubrey C. Swaney,* B.A.; Irl C. Schoonover,† Ph.D.; George Dickson,‡ M.S., and Gilbert F. Glasson,* D.D.S., Washington, D. C.

ANNUALLY the National Bureau of Standards and the Council on Dental Research agree upon a cooperative research program on dental materials. Normally either group hesitates to request during the year the addition of other projects to this program because to do so obviously delays progress in the planned procedure which is outlined on a definite time basis. However, on some occasions the Council on Dental Research has requested that the National Bureau of Standards include additional projects when the need arose. During the past year the unusual properties claimed for a new silicate cement, Diafil, made it desirable to request an immediate investigation of this cement.

Another reason for requesting an exception in this particular instance is that the American Dental Association Specification No. 9 for Dental Silicate Cement is being revised. If Diafil has the properties claimed by the manufacturer, then the specification should undergo a radical revision. It was soon found that the new cement did not have the unique or special properties proclaimed. Furthermore, it will be obvious from this report that many of these claims are harmful to good dentistry as they tend to nullify the instructions to use great care in mixing and placing silicate cements.

After some of the advertising statements which are the subject of this investigation were questioned by the Council on Dental Research, Pfingst and Company, manufacturers of Diafil, said that some of these statements would not be used again. No public retraction or correction of any of these statements was ever brought to the attention of the Council.

This report demonstrates once more why dentists should follow and rely on the certification program and use the list of certified dental materials. The most recent list of certified dental materials was published on page 358 of the March 1949 and page 79 of the July 1949 issues of THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION. The silicate cements on this list are guaranteed by their respective manufacturers to comply with American Dental Association Specification No. 9 for Dental Silicate Cement. Diafil is on this list.

The American Dental Association is financially supporting this program with money derived from dues. What is the logic for any dentist to ignore this testing and certification program and be swayed by rash and extravagant statements?—*Council on Dental Research: M. D. Huff; R. H. Volland; M. K. Hine; J. L. T. Appleton, chairman; Charles B. Hall, secretary.*

Publication authorized by the National Bureau of Standards and the Council on Dental Research of the American Dental Association.

*Research Associate of the American Dental Association at the National Bureau of Standards.

†Chief, Dental Materials Section, National Bureau of Standards.

‡Dental Materials Section, National Bureau of Standards.

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INTRODUCTION

In 1947, the Dental Products Corporation, 235 College Street, Toronto, Ontario, Canada, stated that work on the development of a new silicate cement had been in progress for the past six or seven years and that during 1946 progress had been such that "practical mouth trials" were conducted; also that in February 1947 the cement, Diafil, was placed on the market in Canada. Under date of February 26, 1948, a mimeographed letter was released announcing that Pfingst and Company, 62 Cooper Square, New York 3, New York, was introducing Diafil, "a proven and satisfactory synthetic porcelain filling material to the American dental profession."

Both concerns made unusual and sometimes unique claims for the cement, Diafil. These included: unique stability of the liquid; properties of the cement unaffected by temperature and humidity at which the cement is mixed; extreme translucency, hardness, toughness and strength; freedom from staining; low acidity; expansion during setting; unusually low solubility, and suitability for universal use as a filling and cementing medium.

In October 1948, the American Dental Association Research Fellowship at the National Bureau of Standards purchased fifteen bottles of Diafil powder and liquid. Later, in December 1948, one bottle each of twelve different shades of Diafil powder were procured from a retail dental supply company.

The tests reported herein on these cements are to a large extent those prescribed by the American Dental Association Specification for Dental Silicate Cement[1] except that the mixing technic employed in the preparation of all test specimens is that prescribed in the proposed revision of this specification.[2] Some of the claims of the manufacturer involved properties not included in the specification; for instance, tests are not prescribed for staining, for hardness and for impact strength. In these instances test methods reported in the literature[3] were used, if available; otherwise specific tests were evolved. Throughout the research comparative tests were made on Diafil and on the silicate cements on the list of certified dental materials.

1. Paffenbarger, G. C.; Schoonover, I. C., and Souder, Wilmer, Dental Silicate Cements: Physical and Chemical Properties and a Specification. *J.A.D.A.* 25: 32 (Jan.) 1938.

2. Manuscript in preparation.

3. Souder, Wilmer, and Paffenbarger, G. C., *Physical Properties of Dental Materials*. Circular of the National Bureau of Standards. C433. Washington, D. C.: U. S. Government Printing Office, 1942.

PROPERTIES OF POWDER AND LIQUID

Liquid.—A statement was made in an advertisement that:

> Diafil liquids have been kept for as many as three years and even radical atmospheric and temperature changes were not able to deteriorate it.

Diafil liquid is, according to its manufacturer, a modified phosphoric acid (H_3PO_4). In a previous investigation such liquids were shown to be sensitive to atmospheric changes and to give off or take up water, depending on the relative humidity.[1]

Data obtained on these liquids show, contrary to the manufacturer's claims, that they are not stable for long periods of time. In some instances, the bottles were improperly sealed when received (Fig. 1, *A*), and leaked subsequently when stored for five weeks at room temperatures [21 C. (70 F.)] (Fig. 1, *B*). Others leaked and the liquid discolored

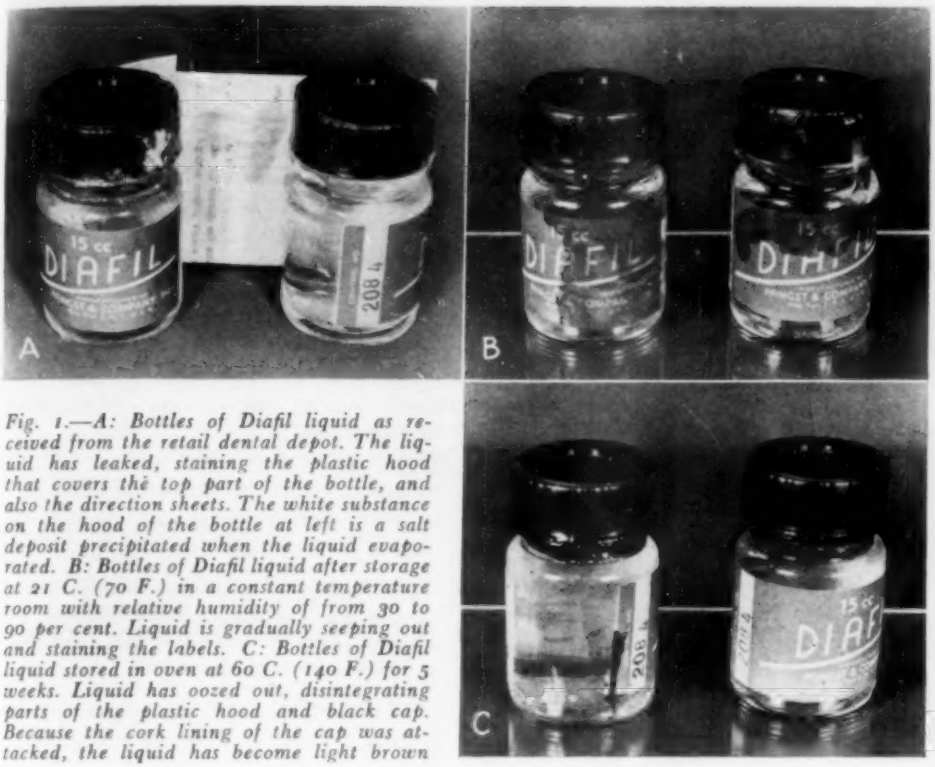

Fig. 1.—A: Bottles of Diafil liquid as received from the retail dental depot. The liquid has leaked, staining the plastic hood that covers the top part of the bottle, and also the direction sheets. The white substance on the hood of the bottle at left is a salt deposit precipitated when the liquid evaporated. B: Bottles of Diafil liquid after storage at 21 C. (70 F.) in a constant temperature room with relative humidity of from 30 to 90 per cent. Liquid is gradually seeping out and staining the labels. C: Bottles of Diafil liquid stored in oven at 60 C. (140 F.) for 5 weeks. Liquid has oozed out, disintegrating parts of the plastic hood and black cap. Because the cork lining of the cap was attacked, the liquid has become light brown

when stored for five weeks at 60 C. (140 F.) (Fig. 1, *C*). Similar results were obtained on other silicate cement liquids.[4]

Powder.—Although no specific claims were made relating to the composition of the cement, a spectrographic analysis of the powder and liquid was obtained (Table 1). The presence of boron (B), beryllium (Be), cesium (Cs) and lithium (Li) as major constituents of any one silicate cement powder has not, to our knowledge, been reported.[1] It does, therefore, appear that Diafil contains several elements in amounts greater than 1 per cent not commonly found in silicate cements. These elements, boron, beryllium, cesium and lithium, in the concentrations employed, do not make the physical properties of Diafil radically different from those of other silicate cements, as will be subsequently demonstrated.

4. Fischer, T. E., and others, Deterioration of Silicate Cements in the Tropics. To be published in the Bulletin of the U. S. Army Medical Department.

PROPERTIES OF CEMENT

Comparative data on some of the physical and chemical properties of: (1) Diafil, as advertised; (2) Diafil, as tested at the National Bureau of Standards, and (3) other silicate cements on the list of certified dental materials as tested at the National Bureau of Standards, are given in Table 2. These data show that the properties of Diafil are not unique and that many of the claims which the manu-

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Table 1.—Spectrochemical analysis of Diafil powder and liquid*

	Major constituents†	Minor constituents and traces†
Powder	Al, B, Be, Ca, Cs, Li, F, Na, Si	Ag, Co, Cu, Fe, K, Mg, Mn, P, Pb, Rb, Zn
Liquid‡	Mg, P, Zn	Al, Ca, Cu, Fe, Pb, Si

*These data were obtained by the Spectrochemistry Section.

†In general, the designation "major constituent" means present in amounts greater than 1 per cent; "minor constituent" or trace means present in amounts less than 1 per cent.

‡The sample was treated with sodium hydroxide prior to spectrographic analysis and a separate determination for sodium was not made.

facturer makes for this cement are not verified.

Other unique claims made by the manufacturer of Diafil were investigated, with the following results.

Sensitivity to Mixing Technic.—It has long been known and repeatedly demonstrated that the mixing of silicate cement requires a careful technic and that the humidity and the temperature at which the cement is mixed has a pronounced effect on the physical properties.

The following statement was made by the manufacturer of Diafil:

> The proper mixing of synthetic porcelain materials has presented a problem to dentists owing to atmospheric and temperature changes. These changes have no effect on the results of Diafil. Diafil is very easily mixed, even under adverse conditions. An ample time of five minutes is given for the slab, while a thorough setting takes place in only three minutes in the mouth. This margin of time allows for more than one filling to be made from the same mix.

In the tests herein reported, evidence was found that Diafil is very much affected by the temperature and humidity of the air in which it is mixed. Diafil appeared to be sensitive to small variations in mixing technic. It was noted in determining the standard testing consistency[1] that different rates of spatulation during the last fifteen seconds caused a variation of from 17 to 23 mm. in the diameter of the disk. Also it was found that approximately 17 per cent less powder could be incorporated in a given quantity of liquid when mixed at 34 C. (93 F.) and 93 per cent relative humidity than when mixed at 21 C. (70 F.) and 35 per cent relative humidity. Decreasing the amount of powder in a mix lowers the compressive strength and increases the solubility, shrinkage and setting time of a silicate cement.[1] These data, contrary to the manufacturer's claims, show that Diafil is affected by "atmospheric and temperature changes."

Premature Exposure to Water.—Another statement which the makers of Diafil give in their advertisements and which is disproven is:

> The "moisture" problem generally encountered in gingival margin cavities such as this does not affect the efficiency with which Diafil fulfills its intended purpose.

This caption was below a drawing depicting a Class V cavity in a lower right cuspid.

It is generally known that silicate cements will not harden properly when in contact with water or saliva.[1] To test Diafil in this respect, a disk of cement was formed between two glass plates. One half of the surface of this disk, *A* in Figure 2, was exposed to water at the time of its initial setting. This surface became white, soft, porous, chalky and opaque. Surface *B*, Figure 2, protected for 30 minutes after the initial setting of the cement occurred, was smooth, translucent and gray, as it transmitted the background on which the photograph was made.

Impact Test.—It was asserted that:

> Diafil has both extreme hardness and toughness and it is due to this fact that it is also suitable for posterior reconstructions. As an illustration of this hardness and toughness, pellets $\frac{3}{16}$" in diameter and $\frac{1}{2}$" in length, after being left one week in water, can be

Table 2.—Properties of Diafil and other silicate cements

Cement	Powder in 0.4 ml. of liquid, grams*	Ultimate compressive strength, pounds per square inch	Solubility and disintegration, per cent by weight	pH†	Dimensional change on setting	Film thickness,‡ microns	Hardness number Vickers	Hardness number Knoop	Arsenic content, per cent	Opacity,§ $C_{0.70}$	Setting time, minutes
Diafil (manufacturer's advertised values)	.....	42,550	0.24	6.4	Expansion 7 to 11 microns‖	.....	89.1	..	.....	Extremely translucent	3
Diafil (values obtained at National Bureau of Standards)	1.3	30,200	1.3	4.5	Shrinkage 0.16 per cent	65	70	67	Less than 0.0002	40	3
Other silicate cements on certified list (range of values obtained at National Bureau of Standards)	1.25 to 1.65	25,200 to 30,200	0.6 to 1.9	4.2 to 5.1	Shrinkage 0.03 to 0.25 per cent¶	40 to 65	..	54 to 79¶	Less than 0.0002	45 to 50	3 to 6

*Amount of powder required to produce standard testing consistency.
†Acidity of aqueous extract of disk of cement crushed 15 minutes after mixing
‡Maximum permitted for zinc phosphate cements is 40 microns.
§The higher the value, the greater the opacity.
‖Length of specimen not given.
¶Values reported in *J.A.D.A* 25:32 (Jan.) 1938.

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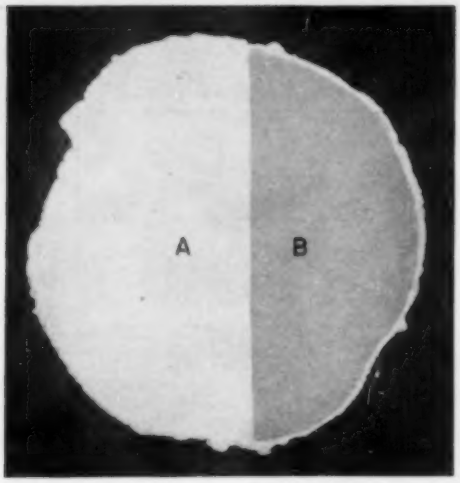

Fig. 2.—Disk of Diafil, one half, A, of which was exposed to water at the time of its initial set (three minutes). The other half, B, was exposed to water 30 minutes later. A is soft, porous, chalky and opaque, whereas B is translucent and transmits the gray background over which the specimen was photographed

driven half their length into blocks of pine wood with an ordinary steel hammer.

The clinical value of such a test is doubtful. In order similarly to compare Diafil with other currently used silicate cements, the following impact test procedure was devised:

1. The specimens were small cylinders 6 mm. in diameter and 10 mm. high.

2. The impact was delivered by a steel ball 32 mm. (1¼ inches) in diameter, dropped through a stainless steel tube 4 feet long. The internal diameter of the tube was 35 mm. (1⅜ inches). A paper bushing about 3 inches long centered the ball in the tube prior to its release.

3. When the steel ball was dropped onto a piece of clear white pine, such as is used in patternmaking, a saucer shaped depression with a diameter of 13 mm. was formed.

4. The specimen was centered on the board under the tube and the ball was dropped.

The average number of impacts that three specimens of Diafil withstood before breaking under the foregoing test was 10.7. Several other cements withstood, on an average, more impacts (13.7, 12.3, 11.3), and several others less (6.7,

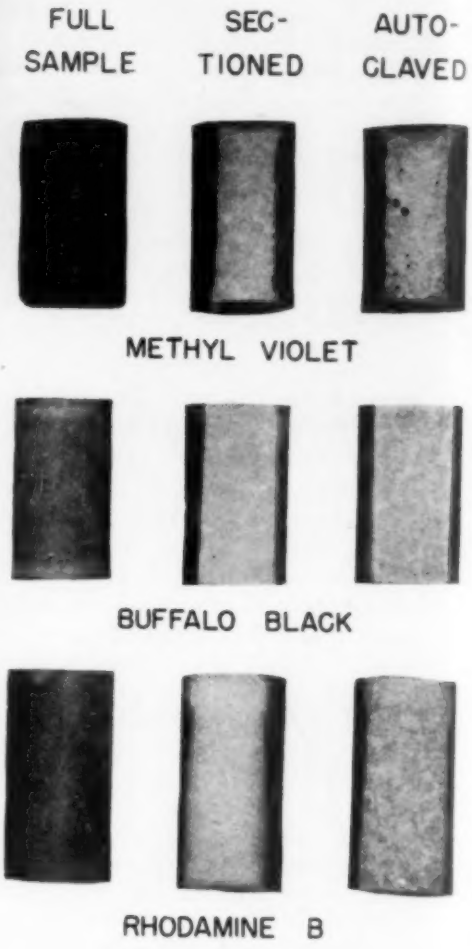

Fig. 3.—Cylinders of Diafil after immersion in 0.2 per cent aqueous solutions of the dyes indicated. A surface of the cylinder was planed parallel to its long axis after the specimen was removed from the dye solution and placed in water. Later the specimens were removed from the water, placed in the dye solution in an autoclave for one hour under steam pressure of 20 pounds per square inch and resurfaced. This did not cause any further penetration of the dye except along the cracks in the specimens

4.0, 3.7, 3.3). Diafil is not unique or unusual as far as resistance to fracture is concerned, under the conditions of the foregoing test. The average depth of penetration of the three specimens of Diafil into the pine board was 4.3 mm., which was less than that of some of the cements (5.7, 5.5, 5.0 mm.), and more than that of others (3.7, 3.3, 2.2, 1.5 mm.).

Staining.—In the advertising literature, resistance of Diafil to staining was described as follows:

> The staining of silicate fillings is mostly due to porosity of the material and the resulting penetration of stains. Diafil, on the other hand, does not stain, which was demonstrated by the following test. Diafil pellets saturated in methylene dye for periods of two weeks or longer, then subjected to twenty pounds of steam in an autoclave for one hour, were then tested. While the pellets were badly stained, it was entirely superficial. The stain could be completely removed either with a piece of sandpaper or by using a scaler.

In order to compare the staining of the various silicate cements, 0.2 per cent aqueous solutions of the following dyes were employed: methyl violet, color index number 680; rhodamine B, color index number 749, and buffalo black, color index number 294. Cylinders of cement approximately 6 mm. in diameter and 12 mm. high, after incubation for one hour at 37 C. (99 F.) and 100 per cent relative humidity, were immersed in the dye solutions where they were left undisturbed for 3 weeks at 37 C. (99 F.).

The surfaces of the cylinders of each cement were darkly stained by the methyl violet solution (pH 5.1). The stain penetrated 0.5 mm. into the cylinder of Diafil. Most of the other cements showed less peneration, but one stained throughout and another stained to a depth of 2 mm. In buffalo black solution (pH 7.6 to 7.9) Diafil showed a slight stain on the surface, as did most of the other cements. In the rhodamine B solution (pH 3.3) Diafil stained to a depth of approximately 0.5 mm., which was more severe than the staining of most of the other cements. In Figure 3, the depth of the penetration of the three dyes in Diafil specimens is shown.

Fig. 4.—Diafil restoration in Class III distal cavity of the upper right lateral incisor three weeks after polishing. This restoration is in an acrylic resin tooth of a full denture worn by a patient who smokes tobacco. Six other silicate cement restorations in this denture showed similar discoloration at the end of three weeks

No support for the claim that Diafil does not stain was found in any of these tests. In fact, it stained more severely than most of the silicate cements in current use. The clinical significance of such dye staining tests is unknown.

To test further the stain resistance of Diafil and to simulate mouth conditions, Class III silicate cement restorations were placed in the distal aspect of right and left acrylic resin lateral incisors of a complete upper denture. Figure 4, taken three weeks after the Diafil restoration was polished, shows that it was beginning to

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stain, as were other cements placed in the same denture.

Temperature Rise on Setting.—It was noted that the heat which was generated when a mix of Diafil was made was greater than normal for silicate cements. Therefore, Diafil and all cements on the list of certified dental materials were measured for rise in temperature during setting by the following technic:

1. The mix was made at 21 C. (70 F.) as heretofore described.

2. A hard rubber specimen mold of the dimensions shown in Figure 5 was filled with cement, and a copper-constantan thermocouple was placed in the approximate center of the specimen.

3. One minute and thirty seconds after the mix was completed, the hard rubber mold with cement specimen and thermocouple in place was transferred to a humidity chamber maintained at body temperature (Fig. 5).

4. Two minutes after the mixing was completed the initial reading was taken.

The data on four cements shown in Figure 6 reveal that the highest temperature reached by any of the cements was the 45 C. (113 F.) recorded for Diafil. Data are not available to show that a rise of 8 C. (14 F.) above mouth temperature in a mass of cement many times the amount usually placed in a tooth is likely to injure the pulp by thermal shock. The data presented here are given in detail because there have been suggestions that such a test should be incorporated into the American Dental Association Specifi-

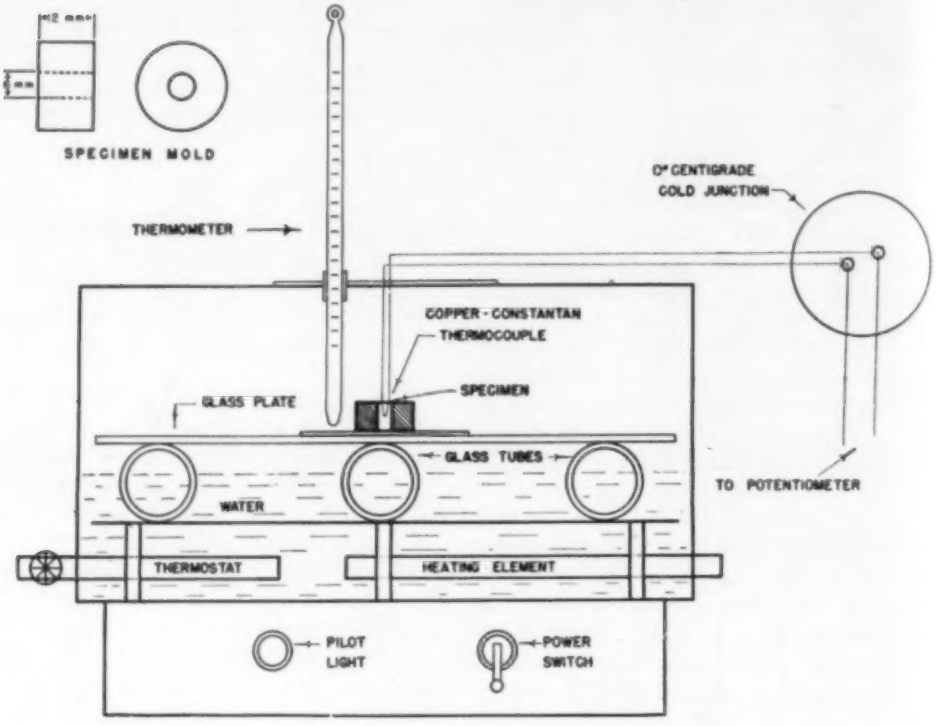

Fig. 5.—Apparatus for determining temperature rise on setting of silicate cement. Inset at upper left shows hard rubber mold for forming specimens used in the test

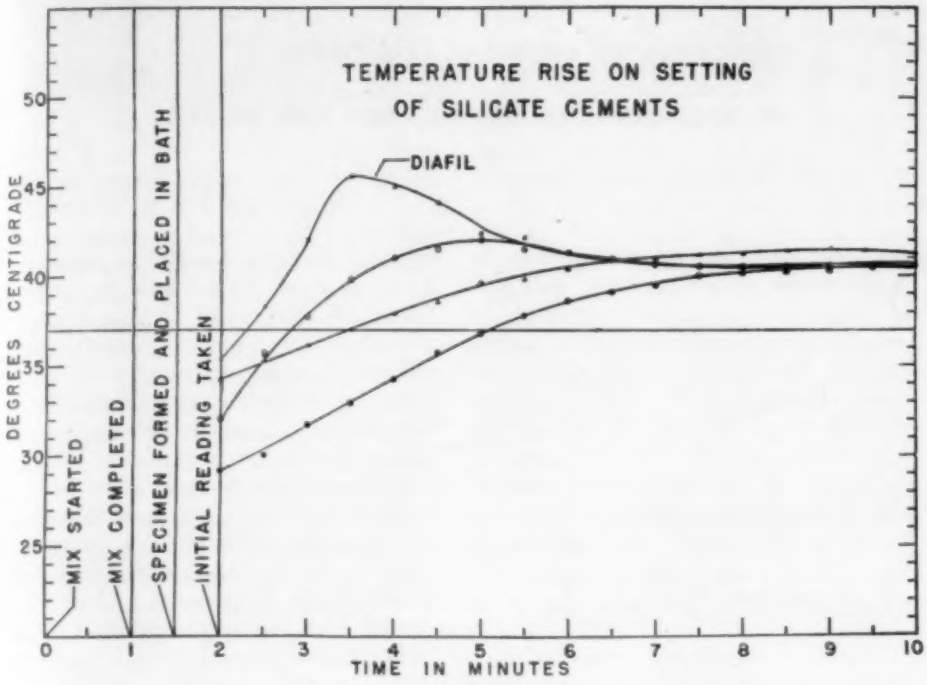

Fig. 6.—Temperature rise on setting of Diafil and three commonly used silicate cements. It cannot be said that this amount of temperature increase has decisive clinical significance

cation No. 9 for Dental Silicate Cement[1] and because some dentists reported to us that they believed the rise in temperature in Diafil might endanger the pulp.

Universality of Use.—The manufacturer recommends Diafil:

> For cavity filling, cementing jacket crowns and bridges, entirely displacing gold and porcelain inlays, rebuilding broken down molars and bicuspids, otherwise indicated for extraction, . . .

There is nothing revealed by the various tests of physical properties which indicates that Diafil is suitable for universal use or that it can effectively displace gold and porcelain inlays.

CONCLUSIONS

1. Diafil is a silicate cement and has the faults and good qualities that other silicate cements have. Its properties are not unique, and extravagant claims which the manufacturer makes for it were not verified in this investigation.

2. Attempts to use Diafil (or any other silicate cement) without care, and disregarding precautions, with the expectation that satisfactory restorations will be produced can lead only to disappointment for the patient and dentist.

3. The sample tested complied with the requirements of the American Dental Association Specification No. 9 for Dental Silicate Cements.

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PRINCIPLES OF SURGICAL TREATMENT OF MALIGNANCIES OF THE FACE AND MOUTH

Louis T. Byars, M.D., St. Louis

SURGERY plays an important role in the treatment of malignancy, but it is simply one of several agents to be considered in planning the care of a given patient. The choice of the therapeutic agent should be made after considering the type of malignancy and its location, extent and characteristics. The final decision may be influenced by the capabilities of the surgeon or other specialist available. It is obviously impossible to set forth a comprehensive set of rules for all cases, but broad principles can be stated.

The first practitioner consulted is in the best position to direct the patient with the minimum delay, but in order to act the examining physician or dentist must suspect the diagnosis. Once suspected, the diagnosis can be confirmed only by direct evidence. Too often opportunity has been lost by allowing indirect evidence, such as a positive Wassermann test or unrelated findings, to delay the diagnosis.

Even if treatment is to be by nonsurgical means, the establishment of the microscopic characteristics of a growth is essential, but often the procedure fails in its purpose. A satisfactory biopsy requires a representative section of the tumor, properly prepared by a competent technician and interpreted by a competent pathologist. A negative biopsy does not necessarily rule out cancer.

Surgical treatment may be carried out by knife or cautery excision. Knife excision is desirable where possible because it is followed by immediate healing, whereas cautery excision is not. Knife excision is essential if immediate repair of a resultant defect is contemplated. However, excision by cautery has advantages in some cases. In certain large lesions about the oral cavity or face, knife excision would be a very bloody procedure, whereas massive destruction of such a region with the electro or thermal cautery can be carried out with little loss of blood. Healing is by secondary intention and repair must be done later. In some areas that are not easily accessible it may be impossible to remove a growth by knife excision without considerable manipulation of an ulcerated surface lesion, resulting in the implantation of cancer cells in a fertile bed. The cautery produces a field not receptive to implants. It must be remembered that cancer cells are probably more easily implanted than are bacteria.

Chemosurgery has attained a certain popularity but does not seem to offer any advantages. It is slow in action and often multiple applications are necessary over a period of some time. The progress of elimination of the growth is checked by repeated microscopic studies, further destruction being done in the region of incomplete removal as indicated by study of many microscopic sections. The difficulty of orientation and chance of laboratory inaccuracy is a disadvantage.

Metastatic lesions of the cervical nodes must be considered in every case of squamous cell carcinoma or adenocarcinoma about the head. Even the basal cell

From the Department of Surgery, Washington University School of Medicine, St. Louis.

Presented on April 28, 1948, and on November 3, 1948, as part of the postgraduate course in "Cancer Control and Oral Diagnosis," given by the University of Illinois College of Dentistry, Chicago.

growth of the skin in some rare instances is sufficiently mixed with squamous elements to result in a remote spread. Not infrequently the cervical metastasis is the first obvious sign of cancer, occurring while the primary lesion is small, silent and hidden. A small ulcer of the epiglottis, base of the tongue, pharynx, tonsil or nasopharynx may cause a growing, nontender, painless lump below and back of the angle of the jaw, in front of the sternomastoid muscle. These characteristics are recognized by the experienced examiner. The inexperienced examiner must remember that such enlargements in the neck in adults are not inflammatory, and he must not indulge in the empiric extraction of teeth and removal of tonsils for their relief. Inflammatory masses in the neck in adults are almost always marked by the characteristic symptoms of acute inflammation. The treatment of metastases to the cervical nodes is surgical removal, not of the enlarged node only, but of the block of tissue containing this node and all others of the region.

Precancerous conditions such as keratoses, leukoplakias, areas of radiation dermatitis and benign tumors, with the potential power to undergo malignant change, must be removed surgically as soon as possible after they are seen.

Cancer of the Skin

The exposed skin surfaces are subject to irritation from external sources and undergo malignant change more often than unexposed surfaces. Cancer of the face, even the more common basal cell type, frequently assumes serious proportions which would not occur on other body surfaces. This is because the natural reluctance on the part of the patient and physician to produce scarring of the face results in inadequate removal or the improper choice of a therapeutic agent. There is no place for compromise in the treatment of cancer. The patient and physician must remember that cancer, without intervening death from other causes, is 100 per cent fatal and that malignancy, uncontrolled, produces mutilation and pain far beyond that of adequate surgery.

The majority of lesions of the skin of the face are small when first seen and can be treated best by excision or local cautery destruction of adequate but not wasteful extent. A basal cell carcinoma that can be permanently destroyed when first seen by burning out an area smaller than a finger nail may require a mutilating procedure for eradication if adequate treatment is delayed.

Growths of the external ear are best treated surgically, excising underlying cartilage if necessary and applying small skin grafts of postauricular skin. Lesions of the nose should not be given repeated or heavy radiation, as the cartilage of both the nose and the ear is superficial and easily damaged. In critical areas such as the eyelids it is safer to do an early curative excision, making an immediate simple repair with skin grafts, than to try radiation first. The belief is widespread that all basal cell lesions are equally sensitive to radiation and that this makes radiation of such growths mandatory. Actually, sensitivity varies considerably, and if radiation fails in a critical area, the chance for adequate excision without faulty function or deformity is lost.

A definite indication for surgical removal is the failure of radiation. If recurrence or failure to control a carcinoma follows radiation therapy, then it should not be continued if the lesion can be excised. Most intelligent patients will choose radical removal of a growth with the chance of subsequent reasonable repair if the entire picture is explained to them. The physician has no right to withhold any form of treatment because he feels it to be "too mutilating." If uncontrolled, the cancer will produce equal mutilation in its relentless progress.

Malignant melanomas are not sensi-

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tive to radiation and should be excised or destroyed surgically. Not all growing black lesions are melanomas. The occasional pigmented nevus or basal cell carcinoma may have a similar appearance but good prognosis.

Cancer of the Lip

In many instances surgical excision of cancer of the lip has been followed by persistence of the growth because fear of deformity has caused inadequate removal. The customary "V" excision is not suitable for the treatment of many growths. For these reasons, and because proper radiation in this area has an excellent chance of success, it is often chosen as the primary treatment. If it fails, then immediate radical excision must be done, often with secondary repair.

Carcinoma of the lip, if extensive, involves the bone of the mandible by direct extension or by entrance through the mental foramen. Involvement by direct extension may be controlled by adequate excision. If, however, the mental foramen or the inferior dental canal has been invaded, the corresponding half of the mandible must be removed by disarticulation. Metastasis from carcinoma of the lip is not as early or frequent as metastasis from carcinoma of the tongue, but it does occur, often first appearing in the "buccal" lymph node overlying the mandible where it is crossed by the facial artery. This node may invade the mandible by direct extension early in its development because of its position. The treatment is early block dissection of the areas of lymphatic drainage.

Carcinoma of the Oral Cavity

Many growths within the mouth are best treated wholly or in part by the interstitial implantation of radium or radon. That portion of a growth which involves or overlies bone should be removed by operation. The soft tissue of the alveolus or hard palate is so thin that even if roentgen examination does not demonstrate invasion, the bone must be considered at least superficially invaded. Some lesions of the mouth are inoperable when first seen. However, if radiation is elected and fails, then surgery should be immediately employed where feasible.

Maxilla and Mandible

The jaws are unique in that they may be the site of two completely different "sets" of tumors, those of osseous origin and those of dental origin. True malignancies are relatively uncommon, and when primary in the bone are usually sarcomatous, arising from the periosteum, the bone or the nerve elements within the bone. An occasional adamantinoma may be malignant.

Secondary malignancy within the bone results from (1) direct extension from contiguous primary cancer, (2) direct extension from adjacent metastatic cancer in a lymph node, (3) invasion along the inferior dental canal by way of the mental foramen and (4) blood borne metastases from the breast or thyroid or some other primary site. Surgical removal is the treatment for jaw tumors, its extent being determined by a knowledge of the characteristics of the individual tumor.

Tumors of the Salivary Glands

The parotid, submaxillary and sublingual glands are the sites of tumors in this order. In our series approximately 25 per cent of salivary gland tumors have been malignant at the time of first examination. The parotid gland is the host of approximately 90 per cent of salivary gland tumors and, because of its relation to the facial nerve, frequently the location of recurrent tumors. The surgeon, for fear of paralyzing the face, may do an inadequate removal. The common tumor here is the "mixed" tumor, which

characteristically appears in relatively young people, is painless, nontender, and slow growing. Such tumors are prone to undergo malignant changes if subjected to the irritating effect of incomplete operation or if permitted to persist through the years. The proper treatment consists of dissection of the facial nerve in order to safeguard it, and complete removal of the tumor. If the tumor occurs in the submaxillary gland, the entire gland should be removed. Radiation therapy should not be attempted.

Primary malignancies occur in these glands, usually later in life. These are fixed and less easily outlined from the onset and are rapid in growth, often causing an early paralysis of the facial nerve if the tumor is in the parotid gland. Treatment is block dissection of the cervical nodes, especially of the posterior chain, and complete removal of the gland and such adjacent bony structures as may be involved. The prognosis is poor.

Cervical Node Metastases

Block removal of gland-bearing tissues of the neck can be done quite thoroughly from the anatomic point of view, with insignificant mortality, even in older patients, and without crippling or unduly deforming effects. It is definitely indicated when the metastasis is evident and the primary lesion is controlled or thought to be controllable. In other circumstances where metastases are suspected or thought to be probable, it should be done for the same reasons that an axillary dissection is done for carcinoma of the breast.

It must be emphasized that in adults inflammatory enlargements of the cervical nodes are attended by the signs and symptoms of acute inflammation and that the "silent" enlargement must be suspected of being a tumor. Too often dangerous tumors are allowed to persist while innocent teeth and tonsils are empirically removed.

Repair of Defects

Plastic repair and the surgical treatment of tumors of the face, mouth and jaws must be considered together in evaluating a problem, since it is the possibility of repair that makes the curative operation acceptable. It is much more important to achieve cure than to make this repair at the time of the original operation or too soon thereafter. Nothing is more discouraging to patient and surgeon alike than to see a tumor recur and invade a repair obtained at the cost of much time and the use of critical materials. In many instances the prognosis justifies immediate repair, which in early cases is often achieved very simply. Otherwise, all stress should be placed on cure and the problem of repair assigned to later consideration.—*400 Metropolitan Building, Grand Avenue and Olive Street.*

▲

Camouflaged Socialism.—Compulsory sickness insurance is socialized medicine notwithstanding the disclaimers of its advocates. A frank admission of this truth undoubtedly would raise questions embarrassing to those who advocate the plan; with tongue in cheek they camouflage socialism by using technics commonly employed by propagandists with revolutionary political programs. The proposed plan for governmental medicine, they say, will not change anything except the method of payment for services. Why then should it require 163 pages, as in the proposed law, and a confused organization of hundreds of councils, boards, committees and similar agencies just to collect and distribute money?—*Ernest E. Irons, "The Time of Decision," J.A.M.A. 140:505, June 11, 1949.*

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CLINICAL EXPERIENCES WITH LIDOCAINE AS A LOCAL ANESTHETIC*

Ralph S. Lloyd,† D.D.S., and James O. Blythe, Jr.,‡ D.D.S., Baltimore

WE HAVE had the opportunity to test objectively a local anesthetic agent which has been developed in Sweden. It is called "lidocaine" and marketed under the trade name "Xylocaine." Erdtman and Löfgren, in 1937, showed that a series of acetanilid derivatives displayed local anesthetic qualities. In subsequent investigations Löfgren and Lundqvist synthetized ω-diethylamino-2.6-dimethylacetanilid, called "L.L-30" or lidocaine, and found that this compound might be of clinical importance as a local anesthetic. The new local anesthetic agent was subjected to pharmacologic and clinical investigations by Goldberg and Gordh.[1]

During the last several months solutions of lidocaine anesthetic were tested in the fields of medicine, surgery and dentistry at the United States Marine Hospital, Baltimore, to determine its efficiency and to discover any untoward results. For the experiment in the Dental Service it was decided that a 2 per cent solution of lidocaine hydrochloride with 1:100,000 epinephrine would be used. This solution would be compared with a 2 per cent solution of procaine hydrochloride with nordefrin ("Cobefrin") 1:10,000 which is currently being used in the Dental Service at our hospital. We were using nordefrin as a vasoconstrictor instead of epinephrine because a series of patients exhibited untoward symptoms such as nervousness and syncope when we used epinephrine in 1:50,000 dilution as a vasoconstrictor. Solutions of 1:10,000 nordefrin and 1:50,000 epinephrine have approximately the same vasoconstricting power.[2]

In formulating the clinical experiments it was not planned that all the cases in which local anesthetics were used would be tabulated. During the course of the experiment lidocaine was administered about 900 times. However, for tabulation we selected as many cases as possible in which bilateral injections could be given at the same time. Procaine was then given on one side and lidocaine on the other in order to eliminate the human factor. This seemed to us a fair way to compare the efficiency and results of the anesthetic. We tried not to let the patient know that an experiment was in progress or that different anesthetics were used. The patients' reactions were recorded before they were dismissed.

Lidocaine was supplied in 1.8 cc. cartridges and procaine was supplied in 2.4 cc. cartridges. Less than one cartridge was used for each injection. It is estimated that the average amount of lidocaine used was 60 per cent that of procaine, both in infiltration and block anesthesia. In some cases only 0.75 cc. of lidocaine was used.

The time from injection to operation or supposed depth of anesthesia was recorded, and the patients were asked to

*Xylocaine is the registered trade name in Sweden, with U. S. trademark application pending.

†Senior dental surgeon, chief of Dental Service, U. S. Marine Hospital, Baltimore.

‡Dental surgeon, assistant to chief of Dental Service, U. S. Marine Hospital, Baltimore.

1. Björn, H., and Huldt, S., The Efficiency of Xylocaine as a Dental Terminal Anesthetic Compared to That of Procaine. *Svensk Tandläkare-Tidskrift* 40:831, 1947.

2. Nevin, M., and Puterbaugh, P. G., *Conduction, Infiltration and General Anesthesia in Dentistry*, ed. 4. Brooklyn: Dental Items of Interest Publishing Company, Inc., pp. 262-278.

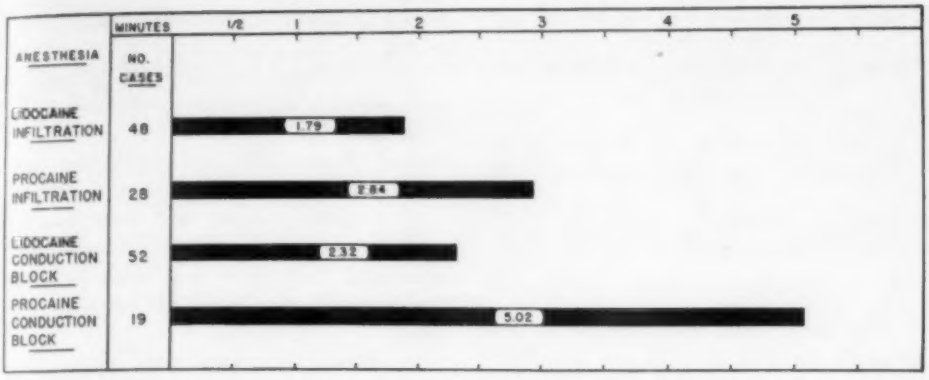

Fig. 1.—Average time to reach depth of anesthesia

inform us when the anesthesia wore off. The progress of anesthesia produced by the two anesthetic solutions was determined both by questioning the patients and by testing the periodontal tissue with the point of an explorer or cotton plier.

Six different dentists, four of whom were interns, cooperated in this experiment. The dentist was aware of the type of anesthetic being used, but he was cautioned not to inform the patients.

The results of the experiment were tabulated and condensed into graphs (Figs. 1 and 2).

When infiltrated, lidocaine produced the depth of anesthesia approximately one minute sooner than procaine. When used in nerve block, lidocaine produced the depth of anesthesia in less than half of the time required by procaine. The time required for lidocaine to produce the depth of anesthesia in nerve block was less than the time required for procaine to be effective when infiltrated.

The average duration of anesthesia with infiltration was approximately the same with lidocaine and procaine. The duration of anesthesia for lidocaine block was apparently one hour longer than procaine block.

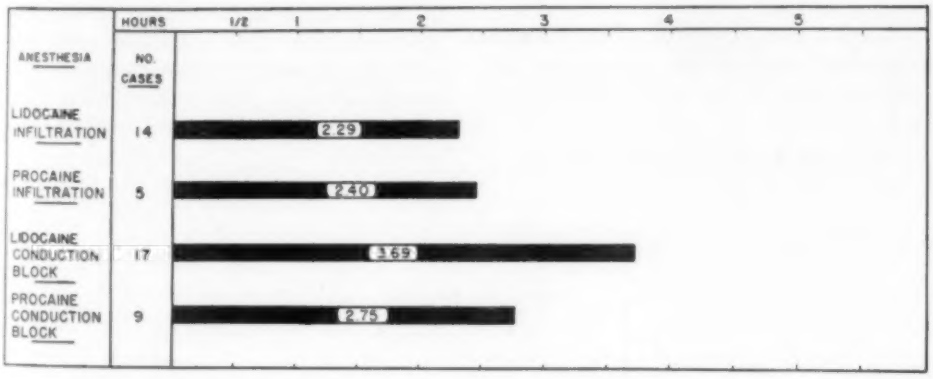

Fig. 2.—Average duration of anesthesia

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Limits of time required for induction of depth of anesthesia

Anesthesia	Shortest time	Longest time
Infiltration		
Lidocaine	25 sec.	3 min., 40 sec.
Procaine	1 min.	4 min., 50 sec.
Block		
Lidocaine	45 sec.	7 min., 15 sec.
Procaine	2 min.	7 min., 45 sec.

The upper and lower limits of time required to reach depth of anesthesia are shown in the table.

The anesthesia which was produced by lidocaine was profound. It was a common observation of patients that the numbness was marked and that they did not feel a thing. The depth of anesthesia obtained with lidocaine was apparently greater than the depth of anesthesia obtained with procaine. Slight sensation was often reported by patients when procaine was used.

In three patients, painful superficial ulceration developed at the point of injection. Lidocaine had been used in two of these cases, procaine in one. Lidocaine was used twice as often as procaine.

Two patients fainted immediately after the anesthetic was injected. One of these patients had lidocaine, and the other had procaine one day and lidocaine the next day. At the time, these reactions were thought to be due to psychic causes.

Some typical reactions of the patients who had lidocaine injected on one side and procaine on the other simultaneously are as follows:

1. More profound anesthesia was induced on the side in which lidocaine was given.

2. Some patients complained that the side in which lidocaine was used was cold and felt "wooden" or "hard as a brick." Some said the anesthesia was too dense. This was given as an objection.

3. Several patients said there was no pain on the side in which lidocaine was used and that there was some pain on the opposite side, in which procaine was used.

4. When lidocaine had been used previously, some patients requested that the operator give him "the stuff you gave me the other time."

5. One patient who had a severe toothache from acute pulpitis was relieved in 60 seconds by the injection of lidocaine.

6. Two patients experienced more pain on the side in which lidocaine was used.

7. On the whole, lidocaine was much more effective in the drilling experiments than procaine. Several patients complained of pain caused by drilling and air when procaine was used. Only one patient complained of slight pain from drilling and air when lidocaine was used, but in one case it was necessary to wait five minutes for complete anesthesia.

It is the general opinion of the dentists who participated in the experiment that lidocaine is an effective local anesthetic. It seems to have some advantages over procaine with nordefrin and, apparently, its objectionable characteristics are not greater. It is believed that lidocaine warrants further trial as a dental anesthetic.

PRELIMINARY PROGRAM
NINETIETH ANNUAL SESSION

SAN FRANCISCO, CALIFORNIA
OCTOBER 17-20, 1949

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OFFICIAL CALL

To the Members of the American Dental Association:

You are hereby notified that the Ninetieth Annual Session of the American Dental Association will be held in San Francisco, October 17 to 20, 1949. The scientific session will be held in the Civic Auditorium.

The House of Delegates will convene for the annual business session of the American Dental Association at 9:30 a.m., Monday, October 17; the second meeting will be held at 1:30 p.m., Monday, October 17; the third meeting at 1:30 p.m., Wednesday, October 19, and the fourth meeting at 1:30 p.m., Thursday, October 20. All meetings of the House of Delegates will be held in the Gold Room of the Fairmont Hotel. The Committee on Credentials will register delegates and alternates beginning at 10 a.m., Sunday, October 16, Fairmont Hotel.

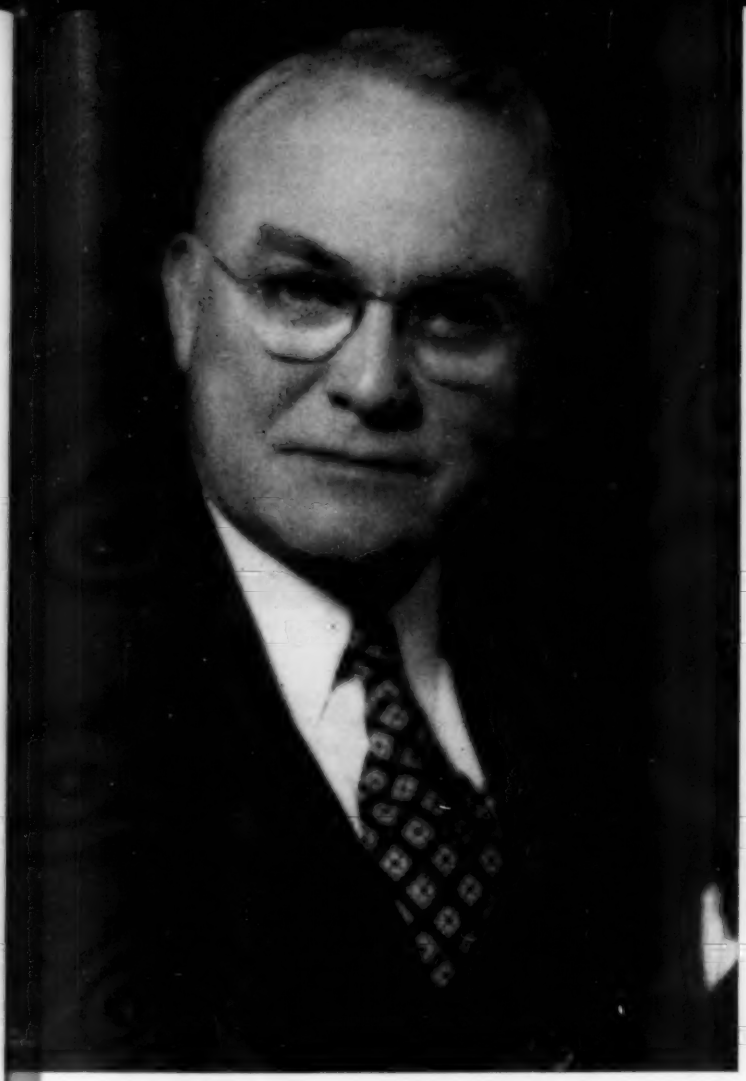
The annual State Officers Conference will be held at the Fairmont Hotel at 9:30 a.m., Sunday, October 16. Registration will open at 9:00 a.m.

General Registration will be held at the Civic Auditorium. The Registration Office will be open from 10:00 a.m. to 5:00 p.m., Sunday, October 16; from 8:00 a.m. to 5:00 p.m., Monday, Tuesday and Wednesday, October 17 to 19, and from 9:00 a.m. to 5:00 p.m., Thursday, October 20.

The General Meeting will be held at 8:00 p.m. on Tuesday, October 18, in the Fairmont Hotel.

At least sixty days prior to the first day of the annual session, the constituent societies must file with the secretary of this Association a list of the names and addresses of delegates and alternates.

Clyde E. Minges, President
Harold Hillenbrand, Secretary



Clyde E. Minges
President
1948-1949

Clyde E. Minges, president of the American Dental Association, was born August 7, 1891, in Newton, N. C. He was graduated from Cades High School, Williamsburg, County, and studied at Horner's Military Academy and Richmond College. He was graduated from the School of Dentistry, University of Louisville, in 1919 and entered general practice in Rocky Mount, N. C. He has been president of the Rocky Mount Dental Society, president and secretary of the Fifth District Dental Society of North Carolina, president of the North Carolina Dental Society and president of the North Carolina Board of Dental Examiners. He was a member of the Board of Trustees of the American Dental Association for two terms, having been elected to that office in 1941.

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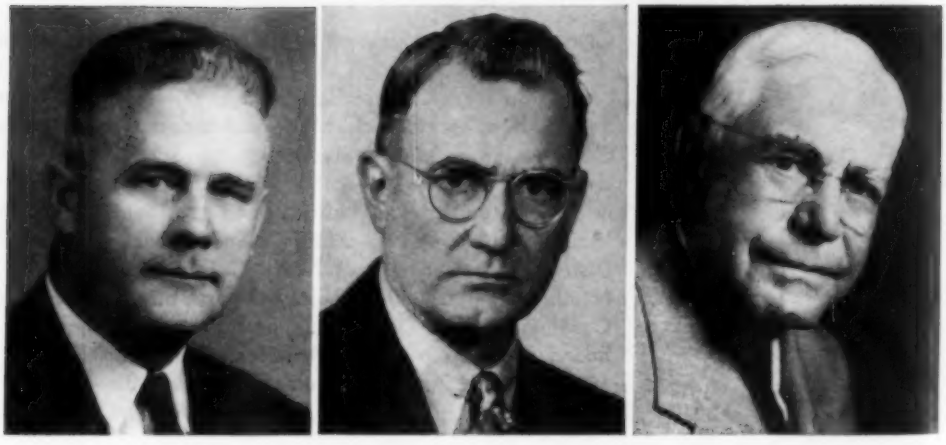
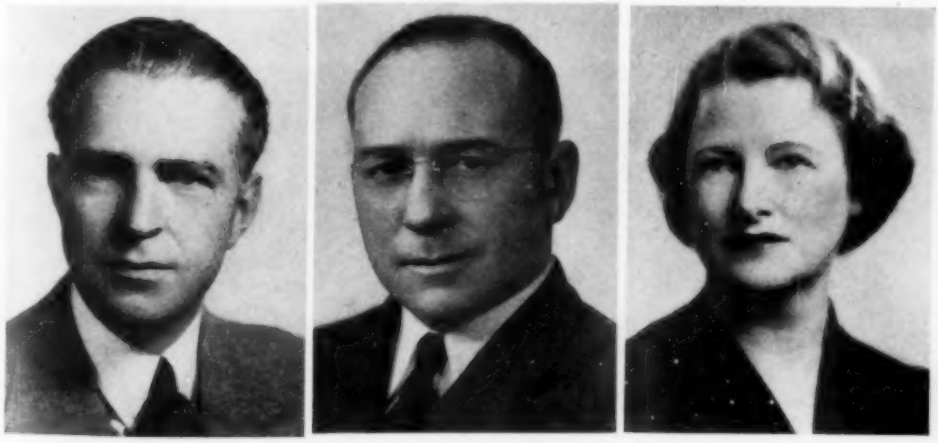
COMMITTEE ON LOCAL ARRANGEMENTS
NINETIETH ANNUAL SESSION OF THE
AMERICAN DENTAL ASSOCIATION
SAN FRANCISCO, OCTOBER 17-20, 1949



Opposite Page, Above: Bernerd C. Kingsbury, General Chairman; Willard C. Fleming, Vice-Chairman. Below: R. Chester Dalgleish, Wilfred H. Robinson (deceased) and Frank M. Casto, Honorary Chairmen

This Page, Above: Walter C. Harrison, Clinic Chairman; Leon W. Moser, Entertainment Chairman; Walter J. Healy, Information Chairman. Below: Reuben L. Blake, Publicity Chairman; Lawrence R. Ludwigsen, Reception Chairman; Mrs. Reuben L. Blake, Women's Entertainment Chairman



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SECTION OFFICERS — CHAIRMEN AND SECRETARIES

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Below: Sanford M. Moose, Chairman and Robert F. Thayer, Secretary: Hospital Dental Service. Alexander Jeffery, Chairman and Rex Ingraham, Secretary: Operative Dentistry

First Row: Ellis B. Jump, Chairman and F. A. Arnold, Secretary: Research. Walter S. Thompson, Chairman and LeRoy M. Ennis, Secretary: Roentgenology

Second Row: Robert L. Borland, Chairman and Cecil H. Bliss, Secretary: Practice Management. H. B. G. Robinson, Chairman and J. M. Wisan, Secretary: Scientific Exhibits

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Third Row: James E. Aiguier, Chairman and Stanley C. Baker, Secretary: Periodontia

THE ESSAY PROGRAM

SECTION ON FULL DENTURE PROSTHESIS

Officers: Carl O. Boucher, chairman; Jack Werner, vice-chairman; A. H. Grunewald, secretary

Tuesday afternoon, October 18

(Combined with the Section on Partial Denture Prosthesis.)

SYMPOSIUM: ELEMENTS OF DIAGNOSIS LEADING TO FULL OR PARTIAL DENTURES. Muller M. DeVan, Philadelphia; Clyde H. Schuyler, New York; Paul Edmand, Chicago; Clauson N. Skinner, Whittier, Calif.

Wednesday morning, October 19

THE APPLICATION OF LABORATORY DATA TO THE CLINICAL USE OF ACRYLIC DENTURE RESINS: Irl C. Schoonover, Ph.D., Washington, D. C.

THE EFFECT OF MOLDING PROCESSES ON THE ADAPTATION AND PROPERTIES OF RESIN DENTURES: Comdr. A. H. Grunewald, Bethesda, Md.

THE IMPRESSION PHASE OF DENTURE CONSTRUCTION: Roland D. Fisher, Glendale, Calif.

Wednesday afternoon, October 19

BASIC PRINCIPLES IN DENTURE CONSTRUCTION: Victor H. Sears, Salt Lake City

THE TEMPOROMANDIBULAR SYNDROME AS RELATED TO FULL DENTURE PROSTHESIS: Louis S. Block, Louisville, Ky.

Thursday morning, October 20

(Combined with the Section on Practice Management.)

THE IMPROVEMENT OF PROSTHETIC SERVICE THROUGH PRACTICE MANAGEMENT: James D. O'Farrell, Houston, Texas

PSYCHOLOGICAL FACTORS INVOLVED IN PRESENTING DENTURE SERVICE: Cecil H. Bliss, Sioux City, Iowa

SECTION ON HOSPITAL DENTAL SERVICE

Officers: Sanford M. Moose, chairman; Barkley S. Wykoff, vice-chairman; Robert F. Thayer, secretary

Tuesday afternoon, October 18

DEPARTMENT OF DENTISTRY IN LARGE HOSPITALS, PROPERLY ORGANIZED FOR DENTAL INTERNSHIP AND DENTAL RESIDENCY TRAINING: Frank J. Houghton, Jersey City, N. J.

Wednesday morning, October 19

(Combined with the section on Roentgenology.)

THE FUNCTIONS OF A DENTAL DEPARTMENT IN THE MODERN HOSPITAL: Edward C. Dobbs, Baltimore

THE VOLTAGE FACTOR (K.V.P.) IN DENTAL ROENTGENOLOGY: Gordon M. Fitzgerald, San Francisco

Thursday morning, October 20

DENTAL SERVICE IN A GENERAL HOSPITAL: Marhl H. Welch, San Francisco

DENTISTRY'S RATIONAL FUNCTION IN THE MODERN HOSPITALS: Paul H. Hamilton, Los Angeles

THE DENTAL ATTENDING STAFF OF THE LOS ANGELES COUNTY HOSPITAL; ITS DEVELOPMENTAL HISTORY AND ITS FUNCTION: J. Lorenz Jones, Beverly Hills, Calif.

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SECTION ON OPERATIVE DENTISTRY

Officers: Alexander Jeffery, chairman; O. B. Coomer, vice-chairman; Rex Ingraham, secretary

Tuesday afternoon, October 18

THE USE OF THE RUBBER DAM CAN MAKE GOOD DENTISTRY EASIER: Ted Gettinger, Los Angeles

AN APPRAISAL OF GOLD FOIL RESTORATIONS: Gerald D. Stibbs, Seattle

CONSTRUCTION OF THE AMALGAM RESTORATION: E. Carl Miller, Cleveland

Wednesday morning, October 19

(Combined with the Section on Pedodontics and Oral Hygiene.)

THE TREATMENT OF FRACTURED PERMANENT ANTERIOR TEETH: John C. Brauer, Los Angeles

Discussion: Bernard Z. Rabinowitch, Los Angeles

THE TREATMENT FOR THE PREMATURE LOSS OF PERMANENT ANTERIOR TEETH: Joseph T. Hartsook, Ann Arbor, Mich.

Discussion: R. Mott Erwin, Jr., Portland, Ore.

THE TREATMENT OF CLASS THREE CAVITIES IN YOUNG PERMANENT TEETH: William W. Demeritt, Los Angeles

Discussion: Helmut A. Zander, Boston

Wednesday afternoon, October 19

HYDROCOLLOID IMPRESSIONS IN OPERATIVE DENTISTRY: Morris J. Thompson, Beverly Hills, Calif.

SOME FUNDAMENTALS OF SUCCESSFUL ENDODONTIC PRACTICE: Floyd D. Ostrander, Ann Arbor, Mich.

THE PROTECTION OF THE DENTAL PULP: Helmut A. Zander, Boston

Thursday morning, October 20

(Combined with the Section on Periodontia.)

THE INTERDEPENDENCE OF RESTORATIVE AND PERIODONTAL PROCEDURES: B. O. A. Thomas, Seattle

ARTICULATION AND ITS RELATION TO PERIODONTAL DISEASE: F. Raymond Garvey, St. Paul

THE NECESSITY FOR DIAGNOSIS IN OPERATIVE DENTISTRY: Don MacQueen, Los Angeles

SECTION ON ORAL SURGERY

Officers: Van B. Dalton, chairman; Glenn J. Pell, vice-chairman; Vernor H. Eman, secretary

Tuesday afternoon, October 18

(Combined with the Section on Roentgenology.)

THE USE OF THE ROENTGEN RAY IN ORAL SURGERY: L. R. Main, St. Louis

Wednesday morning, October 19

(Combined with the Section on Orthodontics.)

SUPERIOR LABIAL FRENOTOMY: Morven Curran, Kansas City, Mo.

THE NON-SURGICAL REDUCTION OF THE LABIAL FRENUM WITH AND WITHOUT ORTHODONTIC TREATMENT: Walter R. Bedell, Poughkeepsie, N. Y.

EXTRACTION IN CASES OF MALOCCLUSION: J. William Adams, Indianapolis

THE NEW SURGICAL TECHNIC FOR THE REDUCTION OF INFERIOR MAXILLARY PROGNATHISM: Arthur E. Smith, Los Angeles

Wednesday afternoon, October 19

THE DENTAL IMPLICATIONS IN THE TREATMENT OF CLEFT LIP AND CLEFT PALATE: H. K. Cooper, Lancaster, Pa.

Discussion: G. W. Christiansen, Detroit

ASPECTS OF ORAL SURGERY OF INTEREST TO THE GENERAL PRACTITIONER: Capt. M. M. Maxwell, San Francisco

Discussion: C. J. Hudson, Cincinnati

A SUMMARY OF TWELVE YEARS' EXPERIENCE WITH TEMPOROMANDIBULAR DISTURBANCES AND THEIR TREATMENT: Louis W. Schultz, Chicago

Discussion: P. Earle Williams, Dallas, Texas

CONSERVATIVE TREATMENT OF CYSTS: P. J. Aufderheide, Cleveland

Discussion: Fred A. Richmond, Kansas City, Kans.

Thursday morning, October 20

(Combined with the Section on Pedodontics and Oral Hygiene.)

THE USE OF SEDATIVES FOR CHILDREN: Earl L. Lampshire, Lincoln, Neb.

Discussion: Charles A. Sweet, Oakland, Calif.

LOCAL ANESTHESIA FOR CHILDREN: Frederic R. Shiere, West Somerville, Mass.

Discussion: Laren W. Teutsch, Omaha

GENERAL ANESTHESIA FOR CHILDREN: Henry Thomason, Cincinnati

Discussion: Niels B. Jorgensen, Los Angeles

SECTION ON ORTHODONTICS

Officers: F. Copeland Sheldon, chairman; George S. Callaway, vice-chairman; J. William Adams, secretary

Tuesday afternoon, October 18

(Combined with the Section on Pedodontics and Oral Hygiene.)

NANCE'S ANALYSIS OF THE DEVELOPING DENTITION — AN INTERIM REPORT: Herbert R. Foster, Oakland, Calif.

Discussion: Clarence W. Carey, Palo Alto, Calif.

THE CAUSES AND PREVENTION OF HABITS DELETERIOUS TO OCCLUSION: George W. Teuscher, Chicago

Discussion: David B. Law, Seattle

THE TREATMENT OF ANTERIOR AND POSTERIOR CROSS-BITES IN CHILDREN: Burdette L. Gainsforth, Ogallala, Neb.

Discussion: Walter T. McFall, Asheville, N. C.

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Wednesday afternoon, October 19

(Combined with the Section on Roentgenology.)

THE CEPHALOMETER IN ORTHODONTIC PRACTICE: Wendell L. Wylie, Seattle

DENTAL ROENTGENOLOGIC FINDINGS IN SYSTEMIC DISEASE: Edward C. Stafne, Rochester, Minn.

Thursday morning, October 20

PRACTICAL AIDS IN ORTHODONTIC DIAGNOSIS: Alton W. Moore, Seattle

ESTHETICS AND ITS RELATION TO ORTHODONTIC THERAPY: Richard A. Riedel, Seattle

SECTION ON PARTIAL DENTURE PROSTHESIS

Officers: Robert P. Dressel, chairman; Loren D. Sayre, vice-chairman; J. R. Gill, secretary

Tuesday afternoon, October 18

(Combined with the Section on Full Denture Prosthesis.)

SYMPOSIUM: ELEMENTS OF DIAGNOSIS LEADING TO FULL OR PARTIAL DENTURES. Muller M. DeVan, Philadelphia; Clyde H. Schuyler, New York; Paul Edmand, Chicago; Clauson N. Skinner, Whittier, Calif.

Wednesday morning, October 19

WHY FIXED CROWN AND BRIDGE PROSTHESIS?: Claude R. Baker, Seattle

INDICATIONS AND THE DIAGNOSIS FOR FIXED PARTIAL DENTURE PROSTHESIS: Alfred C. Young, Pittsburgh

Wednesday afternoon, October 19

PRINCIPLES OF CAVITY PREPARATION IN CROWN AND BRIDGE PROSTHESIS: Lewis W. Thom, Minneapolis

THE PONTIC IN FIXED PROSTHESIS — ITS MORPHOLOGY AND ADVANCED ENGINEERING: Harry R. Potter, Los Angeles

Thursday morning, October 20

THE ROLE OF THE PRECISION ATTACHMENT IN PARTIAL DENTURE PROSTHESIS: George M. Hollenback, Encino, Calif.

THE IMPORTANCE OF BALANCING THE OCCLUSION IN PERIODONTAL TREATMENTS: Robert H. Okey, St. Paul

SECTION ON PEDODONTICS AND ORAL HYGIENE

Officers: Ralph L. Ireland, chairman; John Chrietzberg, vice-chairman, R. Mott Erwin, Jr., secretary

Tuesday afternoon, October 18

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THE TREATMENT OF CLASS THREE CAVITIES IN YOUNG PERMANENT TEETH: William W. Demeritt, Los Angeles

Discussion: Helmut A. Zander, Boston

Wednesday afternoon, October 19

(Combined with Section on Research.)

SYMPOSIUM: CONTROL OF CARIES BY LOCALLY-ACTING AGENTS. Moderator: Hermann Becks, San Francisco

THE USE OF TOPICALLY APPLIED SOLUTIONS OF SODIUM FLUORIDE: John W. Knutson, Washington, D. C.

THE USE OF ZINC CHLORIDE AND POTASSIUM FERRICYANIDE: Harold B. Younger, Dallas

THE USE OF ANTIBIOTICS AND OTHER BACTERIAL INHIBITORS: Joseph F. Volker, Birmingham, Ala.

Thursday morning, October 20

(Combined with Section on Oral Surgery.)

THE USE OF SEDATIVES FOR CHILDREN: Earl L. Lampshire, Lincoln, Neb.

Discussion: Charles A. Sweet, Oakland, Calif.

LOCAL ANESTHESIA FOR CHILDREN: Frederic R. Shiere, West Somerville, Mass.

Discussion: Laren W. Teutsch, Omaha

GENERAL ANESTHESIA FOR CHILDREN: Henry Thomason, Cincinnati

Discussion: Niels B. Jorgenson, Los Angeles

SECTION ON PERIODONTIA

Officers: James E. Aiguier, chairman; Harold G. Ray, vice-chairman; Stanley C. Baker, secretary

Tuesday afternoon, October 18

CORRECTION OF TRAUMATIC FORCES AFFECTING THE PERIODONTAL STRUCTURES: Edgar James, Detroit

THE SYSTEMIC FACTORS IN THE ETIOLOGY AND TREATMENT OF PERIODONTAL DISEASE: Arvin William Mann, Fort Lauderdale, Fla.

Wednesday morning, October 19

(Combined with the Section on Research.)

THE HISTOLOGIC CHANGES OF THE GINGIVAL TISSUES IN HEALTH AND PERIODONTAL DISEASE: Lt. Col. Joseph L. Bernier, Washington, D. C.

GINGIVOPLASTY — A PHILOSOPHY OF PERIODONTAL THERAPY: Henry M. Goldman, Boston

Wednesday afternoon, October 19

SOME SOCIO-BIOLOGIC FEATURES OF PERIODONTIA: Nina Simmonds, Sc.D., San Francisco

USE OF THE TOOTH BRUSH IN THE TREATMENT OF PERIODONTAL DISEASE: Maynard K. Hine, Indianapolis

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Thursday morning, October 20

(Combined with the Section on Operative Dentistry.)

THE INTERDEPENDENCE OF RESTORATIVE AND PERIODONTAL PROCEDURES: B. O. A. Thomas, Seattle

ARTICULATION AND ITS RELATION TO PERIODONTAL DISEASE: F. Raymond Garvey, St. Paul

THE NECESSITY FOR DIAGNOSIS IN OPERATIVE DENTISTRY: Don MacQueen, Los Angeles

SECTION ON PRACTICE MANAGEMENT

Officers: Robert L. Borland, chairman; Lloyd H. Dodd, vice-chairman; Cecil H. Bliss, secretary

Tuesday afternoon, October 18

ACHIEVING SOUND VALUES FROM DENTISTRY FOR CHILDREN: Walter T. McFall, Asheville, N. C.

TRENDS IN POPULATION AND ECONOMICS WHICH AFFECT DENTISTRY: Loren T. Hunt, Lincoln, Neb.

Wednesday morning, October 19

PATIENT EDUCATION: A FACTOR IN MAINTAINING A SUCCESSFUL PRACTICE: Gaylord J. James, Cleveland

TRAVELING THE DENTAL HIGHWAY TO SUCCESS: George E. Steninger, San Francisco

Wednesday afternoon, October 19

A POST-PAYMENT PLAN: THE "ETHICONOMIC" ANSWER TO COMPULSORY PREPAYMENT PLANS. SECTION 1. DIAGNOSIS OF FINANCIAL RESPONSIBILITY. SECTION 2. TECHNIC OF PATIENT FINANCE: J. C. A. Harding, San Diego, Calif.

Thursday morning, October 20

(Combined with the Section on Full Denture Prosthesis.)

THE IMPROVEMENT OF PROSTHETIC SERVICE THROUGH PRACTICE MANAGEMENT: James D. O'Farrell, Houston, Texas

THE PRESENTATION OF THE FULL DENTURE PROBLEM TO THE PATIENT: Cecil H. Bliss, Sioux City, Iowa

SECTION ON RESEARCH

Officers: Ellis B. Jump, chairman; S. F. Bradel, vice-chairman; F. A. Arnold, Jr., secretary

Tuesday afternoon, October 18

THE PRESENT CONCEPTS OF THE HISTOPATHOLOGY OF CARIES: James Nuckolls, San Francisco

Discussion: Harold J. Noyes, Portland, Ore.

THE CONTROL OF CARIES BY THE ADDITION OF FLUORIDES TO PUBLIC WATER SUPPLIES: Francis A. Bull, Milwaukee

Discussion: J. R. Blayney, Chicago

PRESENT STATUS OF LABORATORY TESTS FOR THE MEASUREMENT OF CARIES ACTIVITY: Marshall L. Snyder, Ph.D., Portland, Ore.

Wednesday morning, October 19

(Combined with the Section on Periodontia.)

GINGIVOPLASTY — A PHILOSOPHY OF PERIODONTAL THERAPY: Henry M. Goldman, Boston

THE HISTOLOGIC CHANGES OF THE GINGIVAL TISSUES IN HEALTH AND DISEASE: Lt. Col. Joseph L. Bernier, Washington, D. C.

Wednesday afternoon, October 19

(Combined with the Section on Pedodontics and Oral Hygiene.)

SYMPOSIUM: CONTROL OF CARIES BY LOCALLY-ACTING AGENTS. Moderator: Hermann Becks, San Francisco

THE USE OF TOPICALLY APPLIED SOLUTIONS OF SODIUM FLUORIDE: John W. Knutson, Washington, D. C.

THE USE OF ZINC CHLORIDE AND POTASSIUM FERRICYANIDE: Harold B. Younger, Dallas

Discussion: Harry Frisbie, San Francisco

THE USE OF ANTIBIOTICS AND OTHER BACTERIAL INHIBITORS: Joseph F. Volker, Birmingham, Ala.

Discussion: Gustav W. Rapp, Chicago

Thursday morning, October 20

A RÉSUMÉ OF RESEARCH IN BIOCHEMISTRY: Henry M. Leicester, Ph.D., San Francisco

THE USE OF RADIOACTIVE ISOTOPES IN DENTAL RESEARCH: Joseph G. Hamilton, M.D., Berkeley

SECTION ON ROENTGENOLOGY

Officers: Walter S. Thompson, chairman; Gordon M. Fitzgerald, vice-chairman; LeRoy M. Ennis, secretary

Tuesday afternoon, October 18

(Combined with the Section on Oral Surgery.)

THE USE OF THE ROENTGEN RAY IN ORAL SURGERY: L. R. Main, St. Louis

Wednesday morning, October 19

(Combined with the Section on Hospital Dental Service.)

THE FUNCTION OF A DENTAL DEPARTMENT IN THE MODERN HOSPITAL: Edward C. Dobbs, Baltimore

THE VOLTAGE FACTOR (K.V.P.) IN DENTAL ROENTGENOLOGY: Gordon M. Fitzgerald, San Francisco

Wednesday afternoon, October 19

(Combined with the Section on Orthodontics.)

THE CEPHALOMETER IN ORTHODONTIC PRACTICE: Wendell L. Wylie, Seattle

DENTAL ROENTGENOLOGIC FINDINGS IN SYSTEMIC DISEASE: Edward C. Stafne, Rochester, Minn.

Thursday morning, October 20

CAUSES OF ERRORS IN ROENTGENOGRAPHIC INTERPRETATION: Henry C. Fixott, Jr., Portland, Ore.

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CLINIC PROGRAM

Tuesday morning, October 18, 9:30 to 12:00 and Thursday afternoon, October 20, 2:30 to 5:00

CROWN AND BRIDGE

ACCURATE IMPRESSIONS, DIES AND OCCLUSAL REGISTRATIONS FOR CAST GOLD CROWNS: Barney E. Farmer, Austin, Texas

TECHNIC FOR MAKING HARD METALLIC-LIKE DIES FROM HYDROCOLLOID IMPRESSIONS: Owen D. Dwight, Los Angeles

CROWN AND BRIDGE IMPRESSION TECHNIC: Clifford Rudine, San Francisco

HYDROCOLLOID IMPRESSION TECHNIC FOR FIXED BRIDGEWORK AND MULTIPLE RESTORATIONS: Emil H. Bollwerk, St. Louis

CAVITY PREPARATION — AN ESSENTIAL FACTOR IN RETENTION OF CROWNS AND BRIDGES: Ralph C. Cooley, Houston, Texas

ADVANCED DESIGN OF THE PORCELAIN AND GOLD PONTIC FOR FIXED BRIDGEWORK: Harry R. Potter, Los Angeles

ABUTMENT DESIGNS FOR FIXED PROSTHESES: Donald E. Smith, Hollywood, Calif.

CLASP DESIGNS FOR REMOVABLE UNILATERAL BRIDGES IN CASES WITH ALL MOLARS MISSING: Charles P. Grosby, St. Louis

TECHNICS PERTAINING TO CROWN AND BRIDGEWORK: Alver Selberg, San Francisco

REINFORCED ACRYLIC CROWNS AND BRIDGEWORK: Milton G. Walls, St. Paul

ACRYLIC JACKET CROWN AND BRIDGEWORK USING THE DIRECT-INDIRECT TECHNIC: Jack F. Cathcart, Berkeley, Calif.

VARIOUS TYPES OF PREPARATIONS FOR LOWER SECOND MOLAR AS A CROWN AND BRIDGE RETAINER: Seizo Murata, San Francisco

DEMONSTRATING CROWN AND BRIDGE TECHNIC TAUGHT AT UNIVERSITY OF CALIFORNIA COLLEGE OF DENTISTRY: Carroll H. Berryman, San Francisco

OPERATIVE DENTISTRY

Amalgam Fillings

BUILDING AN AMALGAM RESTORATION: James T. Sweeney, Lodi, Calif.; Edmund V. Street, San Francisco

MAKING AMALGAM RESTORATIONS UNDER UNUSUALLY DIFFICULT CONDITIONS: John E. Rhoads, San Jose, Calif.

CRITERIA FOR SELECTING AMALGAM AS A FILLING MATERIAL: Mark W. Abernethy, Tacoma, Wash.

Gold Inlays

SIMPLIFIED CAVITY PREPARATION FOR INLAYS: B. Placek, Chicago

ANTERIOR THREE-QUARTER CROWNS—CAVITY PREPARATION AND DIRECT WAX PATTERNS: John D. Guthrie, Seattle

CEMENTING GOLD INLAYS: W. H. Gyllenberg, Longview, Wash.

Gold Foil Fillings

GOLD FOIL FILLINGS — A PRACTICAL PART OF DENTAL PRACTICE: Jones Gold Foil Study Group.

Directors: Rex Ingraham, Hollywood, Calif.; Lem V. Sweet, South Gate, Calif. Clinicians: C. C. Andree, Glendale, Calif.; Byron D. Andrews, Beverly Hills, Calif.; Roy A. Fetterman, South Pasadena, Calif.; Donald J. Hodge, Inglewood, Calif.; John W. Morrison, Downey, Calif.

GOLD FOIL FILLINGS: Golden Gate Study Club.

TECHNIC FOR CLASSES IV AND V GOLD FOIL FILLINGS: John Tocchini, South San Francisco; Lawrence R. Ludwigsen, San Francisco

TECHNIC FOR CLASS III GOLD FOIL FILLINGS, WOODBURY TYPE AND INCONSPICUOUS TYPE: Walter L. Cuthbertson and William F. Tilden, San Francisco

CHAIRSIDE ASSISTING: E. Frank Inskipp and Harry A. True, San Francisco

GOLD FOIL FILLING — A PERMANENT AND ESTHETIC RESTORATION FOR ANTERIOR TEETH: Bruce B. Smith, Seattle

Ceramics and Acrylics

PORCELAIN JACKET CROWNS AND CLASS III INLAYS: John C. Bartels, Portland, Ore.

METHYL METHACRYLATE RESTORATIONS IN OPERATIVE DENTISTRY: William T. Fridinger, Cumberland, Md.

APPLICATION OF PORCELAIN TO MATRIX: W. H. Hagen, Seattle

THE USE OF ACRYLIC RESIN AS A FILLING MATERIAL: Roy P. Rheuben, Reno, Nev.

Endodontia

ARMENTARIUM AND METHODS FOR ROOT CANAL THERAPY: Alfred C. Long and George C. Sharp, Pasadena, Calif.

TOOTH CONSERVATION BY ENDODONTIC PROCEDURES: Bertram L. Wolfsohn, San Francisco

THE USE OF 9-AMINOACRIDINE HYDROCHLORIDE IN ENDODONTIA: Lester E. Breese, Oakland, Calif.

Basic Science

CASE STUDIES OF INFLAMMATORY AND NEOPLASTIC DISEASES OF THE ORAL CAVITY: John K. Young, San Francisco

ANATOMICAL DISSECTIONS OF THE TEMPOROMANDIBULAR JOINT, INTRA-TEMPORAL FOSSA AND RELATED STRUCTURES: Dale D. Chow and James A. McDowell, San Francisco.

RECOGNITION OF EARLY ORAL CANCEROUS LESIONS: Ralph S. Lloyd, Baltimore

DETECTION OF ORAL CANCER: Cmdr. R. A. Colby, Bethesda, Md.

Dental Caries Control

DENTAL CARIES CONTROL IN A PRIVATE PRACTICE: J. Eugene Ziegler, Los Angeles

INTERESTING EXPERIMENTS IN RELATION TO TOOTH DECAY: Carl H. Scheu, Lakewood, Ohio

ORAL SURGERY AND ANESTHESIA

ANATOMICAL CONSIDERATIONS IN LOCAL ANESTHESIA: Lyall O. Bishop, Berkeley, Calif.; Thomas W. Karnes, Burlingame, Calif.; Ray J. Weinheimer, Oakland, Calif.

SURGICAL TREATMENT OF MANDIBULAR PROGNATHISM: Conrad I. Karleen, M.D., Minneapolis

GRAFTING CANCELLOUS ILEAC BONE TO THE MANDIBLE: Robert H. Moore, Staten Island, N. Y.

SURGICAL REMOVAL OF IMPACTED TEETH: Leo M. Globensky, Benton Harbor, Mich.

SIMPLIFIED EXTRA-ORAL FRACTURE FIXATION: J. Roy Bourgoyne, Memphis, Tenn.

TREATMENTS FOR SUBLUXATION AND DISLOCATION OF THE TEMPOROMANDIBULAR JOINT: Comdr. Theodore A. Lesney, Bethesda, Md.

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PREPARATION OF ALVEOLAR RIDGES FOR IMMEDIATE DENTURES: E. Benton Conaway, Columbus, Ohio

ROOT AMPUTATION: Jacob Feinman, Staten Island, N. Y.

PROCEDURES USED IN EXODONTIA: Francis R. Jurdy, Spokane, Wash.

ORAL SURGERY FOR THE GENERAL PRACTITIONER: Jack C. Garretson, Seattle

CONTROL OF HEMORRHAGE WITH ABSORBABLE GELATIN SPONGE: Spencer Muir Crump, Glendale, Calif.

ORTHODONTICS

ORTHODONTIC AIDS IN APPLIANCE PLANNING TO MORE CLOSELY APPROXIMATE PHYSIOLOGICAL TOOTH MOVEMENT: Walter J. Furie, Long Beach, Calif.; Elmo Tucker, Seattle

CEPHALOMETRIC PROCEDURES IN ORTHODONTIC TREATMENT: William A. Elsasser and Eugene E. West, San Francisco

PEDODONTICS

OPERATIVE AND RESTORATIVE PROCEDURES USED IN DENTISTRY FOR CHILDREN: Floyde E. Hogeboom, Los Angeles

THERAPY FOR EXPOSURE OF VITAL PULP IN YOUNG PERMANENT TEETH: I. Irwin Beechen, Oakland, Calif.

TREATMENT OF EXPOSED PULPS IN VITAL PRIMARY AND PERMANENT TEETH: Charles A. Sweet, Jr., Oakland, Calif.

THE VITAL PULPOTOMY TECHNIC FOR THE MIXED DENTITION: Bernard A. Smith, Oakland, Calif.

CAVITY PREPARATION OF DECIDUOUS TEETH: Sanford Ballinger, Salt Lake City

THE USE OF SIMPLE APPLIANCES TO PREVENT MALOCCLUSION: Elsie C. Schildwachter, Huntington Park, Calif.

FIXED AND REMOVABLE PROSTHETIC APPLIANCES FOR CHILDREN: Francis W. Summers, Los Angeles

PERIODONTIA

BITE GRINDING AND SPLINTING IN THE TREATMENT OF PERIODONTAL DISEASE: Jean P. Cantou, San Francisco

SURGICAL TECHNIC FOR CORRECTING DRIFTING OF ANTERIOR TEETH: Paul J. Boyens, San Francisco

TREATMENT OF PYORRHEA BY ELECTROCOAGULATION AND CONVENTIONAL SURGICAL PROCEDURES: Vernon H. Langdon, San Leandro, Calif.

SURGICAL GINGIVECTOMY AND GINGIVAL MEDICATION: Maurice R. Growney, San Francisco

PERIODONTAL SURGERY FOR THE GENERAL PRACTITIONER: Clarence E. Butler, San Francisco

PERIODONTAL AND APICAL DISTURBANCES ASSOCIATED WITH DRIFTING OF LOWER ANTERIOR TEETH: Rowe Smith, Texarkana, Ark.

NUTRITION IN PERIODONTAL PRACTICE: Lowell N. Peterson, San Francisco

PROCEDURES FOR THE SURGICAL ELIMINATION OF GINGIVAL POCKETS: A. W. Ward, San Francisco

USE AND CONTROL OF ALKALINE AND ACID CAUSTICS DURING TREATMENT OF PERIODONTAL DISEASE: Philip S. Haley, San Francisco

SURGERY OF POCKET ELIMINATION WITH SPECIAL EMPHASIS ON THE INTERPROXIMAL AREA AND USE OF INTERPROXIMAL CURETTES: Paul J. Ward, San Francisco

PROSTHODONTIA

Full Dentures

MUSCLE TRIMMED IMPRESSION FOR IMMEDIATE LOWER DENTURE: R. W. Ellis, Salem, S. D.

TECHNIC FOR FUNCTIONAL MANDIBULAR IMPRESSIONS: A. S. Lehman, Hollywood, Calif.

FOURNET IMPRESSION TECHNIC AND THE DUAL CHECK ARTICULATOR: Eugene Jenkins, Knoxville, Tenn.

IMPRESSION TECHNIC FOR FULL LOWER DENTURES: William G. Maison, San Francisco

THE USE OF ALGINATE IMPRESSIONS FOR FULL DENTURES AND METHOD FOR REGISTRATION OF CENTRIC OCCLUSION: Browning O. Chartrand, Agnew, Calif.; Ray E. McGinnis, Santa Clara, Calif.

APPLICATION OF THE "CENTRECHECK" IN FULL DENTURE PROSTHESIS: David Cooper, Washington, D. C.

IMPORTANCE OF GOTHIC ARCH TRACINGS IN PROSTHETICS: A. W. Spaulding, Los Angeles

REPRODUCTION OF ANTERIOR TEETH WITH ACRYLIC TEETH FOR IMMEDIATE DENTURES: Elton F. Carlile, Marysville, Calif.

PHONETICS AND ESTHETICS IN PROSTHETICS: Albert Earl Pound, Los Angeles

PROCEDURES IN FULL DENTURE CONSTRUCTION: Robert L. Robinson, Memphis, Tenn.; Leland E. Weyer, New Orleans

FULL DENTURE CONSTRUCTION: Portland Prosthetic Club. Director: S. C. Robinson, Portland, Ore.

THE PRELIMINARY LOWER IMPRESSION: George W. Redpath, Portland, Ore.

TRIMMING THE LOWER TRAY: Sam H. Gortler, Portland, Ore.

THE LOWER IMPRESSION: Chalmer Lee George, Portland, Ore.

THE PRELIMINARY UPPER IMPRESSION: Edward J. Hagan, Portland, Ore.

TRIMMING OF THE UPPER TRAY, BASIC IMPRESSION AND MUSCLE TRIMMING: Burt L. Lageson, Medford, Ore.

PLASTER CORE AND POST DAM OF UPPER IMPRESSION AND TRIAL PLATES: J. Everett Hagan, Milwaukie, Ore.

DENTURE SPACE AND APPROXIMATE BITE: Carl E. Liebe, Portland, Ore.

CORRECTED OCCLUSAL RELATION RECORD: M. Arch Milligan, Portland, Ore.

ECCENTRIC RELATIONSHIPS: Mark S. Skiff, Jr., Portland, Ore.

FULL DENTURE TECHNIC AS PRACTICED IN THE NAVY DENTAL CORPS: Comdr. Charles D. Hemphill, San Francisco

REPRODUCING CHARACTERISTICS OF NATURAL TEETH IN DENTURES MADE ENTIRELY OF ACRYLIC RESIN: Harry E. Bengtsson, Norwalk, Calif.

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PROGRESSIVE CURE CONTROL OF DENTURE PLASTICS FROM PERIPHERY TOWARD CENTER OF CASE: Charles S. Ballard, Seattle

Partial Dentures

ANATOMIC, PHYSIOLOGIC AND MECHANICAL FACTORS RELATED TO PARTIAL DENTURES: Clawson N. Skinner, Whittier, Calif.

SPRING-BAR STRESS BREAKERS: Col. Tyler J. Walker, San Francisco

STRESS BREAKING ATTACHMENTS FOR PARTIAL DENTURES: Leonard O. Edgar, Spokane, Wash.

PARTIAL DENTURE CONSTRUCTION: Comdr. E. J. Holubek, San Francisco

THE DESIGN OF PARTIAL DENTURES: George F. Kuehner, New Ulm, Minn.

ROENTGENOLOGY

DENTAL ROENTGENOLOGY — EXTENSION CONE TECHNIC AND INTERPRETATION: Gordon M. Fitzgerald, San Francisco

DENTAL PHOTOGRAPHY AND CINEMATOGRAPHY: Samuel M. Nagourney, Los Angeles

AMERICAN DENTAL HYGIENISTS' ASSOCIATION

PATIENT RECALL SYSTEMS: Olive Nelson, Worcester, Mass.

THE DENTAL HYGIENIST IN HOSPITAL PRACTICE: Genevieve C. Wozniak, Detroit

MOUTH HYGIENE DURING ORTHODONTIC TREATMENT: Mrs. Stanley J. Rogge, Milwaukee

TOPICAL APPLICATION OF SODIUM FLUORIDE: Margaret Dillon, Washington, D.C.

AMERICAN DENTAL ASSISTANTS ASSOCIATION

FIRST IMPRESSION: Margo Fry, Miami, Fla.

YOUR RECEPTION ROOM: Kathleen Nezbeth, Alliance, Ohio

CORRECT ATTIRE FOR THE DENTAL ASSISTANT: Anna Carey, Lima, Ohio

PATIENTS' RECORDS: Esther Osborn, Ft. Worth, Texas

TELEPHONE PERSONALITY: Blanche M. Carte, Charleston, W. Va.

PRACTICAL SUGGESTIONS: Eleanor MacPhie, Toledo, Ohio

THE DENTAL ASSISTANT AND HER DUTIES: Mary Ellen Horn, Akron, Ohio

DENTISTRY FOR CHILDREN—THE ASSISTANT'S DUTIES: Marilyn Bickart, Canton, Ohio

AIDS FOR YOU, THE ASSISTANT: Mildred Clemens, Onawa, Iowa

EFFICIENCY AND HOBBIES IN DENTAL ASSISTING: Lucille McClain, Augusta, Ga.

PRACTICE MATH — ADDITION, ATTRACTION, MULTIPLICATION AND DIVERSION: Connie Doyle, Jasonville, Ind.

101 ASSISTS: Mary Ferrise, St. Paul

ASSISTANCE FOR THE ASSISTANT: Opal Ioerger, Wichita, Kan.

QUIET PLEASE: Genevieve Conforti, Pittsburgh

THE IMPORTANCE OF PROFESSIONAL TRAINING FOR THE DENTAL ASSISTANT: Ruth Catron, Detroit

ASSISTANCE IN TRAINING THE NEW ASSISTANT: Ruth Allard, Sioux City, Iowa

PRACTICE BUILDING SUGGESTIONS: Roberta Young, Topeka, Kan.

THE PROGRESS OF DENTISTRY: Dorothy Jennings, Kansas City, Mo.

YOU CAN HELP — NEVER LOSE A PATIENT: Gloria Fuller, Cincinnati, Ohio

THE ASSISTANT INVESTS WAX PATTERNS: Glee Volk, Omaha

THE USE OF THE VACUUM CASTING PROCESS: Lois Castle, Los Angeles

TREATMENT OF WAX INLAY PATTERNS: Gloria Graham, Santa Barbara, Calif.

FINISHING STUDY MODELS: Marlys Gommels, Fort Dodge, Iowa

EMERGENCY REPAIRS OF ACRYLIC REPLACEMENTS: Mary Ann Whalley, Los Angeles

EMERGENCY ARMANENTARIUM FOR ORAL SURGERY: Lelia Hanley, West Palm Beach, Florida

THE ASSISTANT IN PRE-OPERATIVE AND POST-OPERATIVE SURGERY: Roberta Wineteer, Wichita, Kan.

FRACTURES OF MANDIBLE AND OTHER FACIAL BONES SEEN BY THE DENTAL ASSISTANT: Mary Hughes Durden, Mobile, Ala.

CARE WITH STERILIZATION: Mildred MacKinnon, Portland, Ore.

THE ROLE OF THE DENTAL ASSISTANT IN ROENTGENOLOGY: Ola Down and Mary Ann Motley, Alexandria, La.

THE ASSISTANT AIDS IN THE SELECTION OF TEETH: Mildred Kraft, Kansas City, Kan.

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SCIENTIFIC EXHIBITS

SERVICE FOR THE PATIENT — FOR THE DENTIST: Iva M. Barker, American Dental Assistants Association

ORAL MALIGNANCIES — THEIR DIFFERENTIAL DIAGNOSIS AND TREATMENT: Joseph L. Bernier, Army Institute of Pathology

DEVELOPMENT OF THE HEAD AND NECK: Sol Bernick, University of Southern California

SLUDGED BLOOD: Edward S. Bloch, University of Chicago

STUDIES WITH AUREOMYCIN: Raymond W. Cunningham, Lederle Laboratories

THE ROLE OF BIO-PLASTIC IN VISUAL EDUCATION: Russell A. Dixon, Howard University

POLLEN STUDIES IN THE NATIONAL PARKS: O. C. Durham, Abbott Laboratories

A COMBINED EXHIBIT OF TEACHING METHODS AND PROCEDURE USED IN THE COLLEGE OF DENTISTRY, UNIVERSITY OF CALIFORNIA: Willard C. Fleming, University of California

FOOD FOR HEALTH (DIET FOR A 10 TO 12 YEAR OLD CHILD): Gladys E. Hall, The American Dietetic Association

COURSES FOR DENTAL HYGIENISTS: Evelyn Hannon, American Dental Hygienists Association

TUMORS AND DISEASES OF THE ORAL CAVITY, THEIR DIAGNOSIS AND TREATMENT: T. A. Hardgrove, Fond du Lac, Wis.

CLEFT PALATE PROSTHESIS: C. S. Harkins, Osceola Mills, Pa.

CANCER AND THE DENTIST: Dallas Johnson, National Cancer Institute

PROCAINE DERMATITIS — AN OCCUPATIONAL DISEASE OF DENTISTS: Edward L. Laden, University of Chicago

TEMPOROMANDIBULAR JOINT IN HEALTH AND DISEASE — PROSTHODONTIST'S VIEWPOINT: Joseph S. Landa, New York

THE TELEPHONE EXTENSION PROGRAM OF THE UNIVERSITY OF ILLINOIS COLLEGE OF DENTISTRY: Saul Levy, University of Illinois

CLINICAL INVESTIGATIVE WORK IN GRADUATE ORTHODONTICS, TUFTS COLLEGE, BOSTON: Herbert I. Margolis, Tufts College

PIGMENTATION OF THE TEETH ASSOCIATED WITH ERYTHROBLASTOSIS FETALIS: Ralph E. McDonald, Indianapolis

TOOTH DEVELOPMENT, TOOTH ERUPTION AND DENTAL CARIES: James Nuckolls, University of California

SILICATE CEMENTS — HOW TO SELECT AND USE THEM: George C. Paffenbarger, A.D.A. Research Fellowship, National Bureau of Standards

COMMON CAUSES OF CASTING FAILURES: Ralph W. Phillips, Indiana University

ANIMAL EXPERIMENTATION: Ralph A. Rohweder, National Society for Medical Research

NAVAL DENTAL RESEARCH: Carl A. Schlack, Naval Medical Research Institute

ORAL CANCER, CYSTS AND TUMORS OF THE JAWS: George S. Sharp, Pasadena, Calif.

DENTAL ROENTGENOLOGIC FINDINGS IN SYSTEMIC DISEASE: Edward C. Stafne, Mayo Clinic

MOTION PICTURE PROGRAM

HEALTH EDUCATION

IT'S YOUR HEALTH: John R. Abel, Southern California State Dental Association

SAVE THOSE TEETH: J. R. Blayney, Walter G. Zoller Memorial Dental Clinic

THE IMPORTANCE OF TEACHING TOOTHBRUSH MASSAGE: Abram Cohen, Philadelphia

YOUR CHILD'S FIRST VISIT TO THE DENTIST: Eduard Georg Friedrich, The Northwest Branch of the Chicago Dental Society

HOME CARE IN ORAL PROPHYLAXIS: Merrill J. Shepro, University of Illinois

INSTITUTIONAL

THEY ALSO SERVE: George B. Larson, American Medical Association

BASIC SCIENCES

ORAL NEOPLASMS AND THEIR DIFFERENTIAL DIAGNOSIS: Hermann Becks and Donald H. Miller, University of California

OPERATIVE

PORCELAIN JACKET CROWN TECHNIQUE: Woodson T. Birthright, Washington, D. C.

ACRYLIC RESINS IN RESTORATIVE DENTISTRY—THE VENEER FACING and (1) VAC-PRESSURE CASTING TECHNIC, (2) AN IMPROVED CEMENTATION TECHNIC: Wilford H. Burwell, Los Angeles

ELASTIC IMPRESSION MATERIALS IN CROWN AND BRIDGE AND INLAY PROSTHESIS USING ALGINATE IMPRESSION MATERIAL and ACRYLIC JACKET CROWN CONSTRUCTION: S. O. Claytor, U. S. Navy Dental Corps

HYDROCOLLOID FOR OPERATIVE DENTISTRY: A. Laurence Dunn, Santa Barbara, Calif.

PREPARATION OF ABUTMENT TEETH FOR FULL CAST CROWN WITH INTERCHANGEABLE FACINGS: David Grosser, Boston

FUNDAMENTALS INVOLVED IN THE SCIENCE OF BITE REVISION: Harry Kazis, Boston

SILICATE CEMENT; DENTAL AMALGAM: FAILURE CAUSED BY MOISTURE CONTAMINATION and DENTURE RESINS: George C. Paffenbarger, National Bureau of Standards and A.D.A. Council on Dental Research

ANTERIOR RESTORATIONS: Earl J. Poe, St. Louis University

SILICATE CEMENT RESTORATIONS INTRODUCING A PLATINUM MATRIX: Godfrey Schroeder, Evanston, Ill.

GOLD INLAY CONSTRUCTION: Zenas M. Shafer, Evanston, Ill.

THE TECHNIC OF AMALGAM RESTORATIONS: Merrill J. Shepro, University of Illinois

SURGERY

SURGICAL ASPECTS OF ORAL LESIONS. REMOVAL OF FIBRO-MYXOMA TUMOR, THROUGH RESECTION OF THE MANDIBLE: Hermann Becks and Donald M. Miller, University of California

ORAL SURGICAL PROCEDURES: Samuel A. Brandon, Portland, Ore.

ALVEOLECTOMIES FOR SYMMETRICITY, AS A SEQUENCE OF CONGENITAL HYPERTRO-

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PHIC OSTEITIS, WITH THE IMMEDIATE INSERTION OF DENTURES: Maxwell P. Chodos, New York

GELFOAM IN ORAL SURGERY: W. C. Guralnick, Boston

PERIODONTIA

PERIODONTIA: S. O. Claytor, U. S. Navy Dental Corps

SURGICAL GINGIVECTOMY: Balint Orban and Merrill J. Shepro, University of Illinois

SURGICAL TREATMENT OF PARADENTOSIS: Albert E. Sanders, Los Angeles

PROSTHETICS

WAX IMPRESSION TECHNIQUE: Henry B. Anderson, Pittsburgh

THE USE OF ALGINATE IMPRESSIONS FOR IMMEDIATE DENTURES: Browning O. Chartrand, Agnews State Hospital

THE ALL PLASTIC DENTURE: Frank L. Hart, San Francisco

A CONSERVATIVE APPROACH TO IMMEDIATE DENTURE PROSTHESIS: Godfrey Schroeder, Evanston, Ill.

IMPRESSIONS AND JAW RELATIONSHIP RECORDS FOR COMPLETE DENTURES: Earle S. Smith, State University of Iowa

THE BEAUTIFUL NECESSITY: J. A. Walters, The Dentists' Supply Company of New York

ANESTHESIA

INTRAVENOUS ANESTHESIA: Donald S. Bartlett, Abbott Laboratories

INTRAVENOUS ANESTHESIA IN THE DENTAL OFFICE: Bernard M. Cohen and R. H. Dwork, New York

PENTOTHAL IN ORAL SURGERY: W. C. Guralnick and P. E. Schultz, Boston

NERVE BLOCK IN CHILDREN'S DENTISTRY: Niels Bjorn Jorgensen, College of Medical Evangelists

TUBEROSITY, POSTERIOR PALATINE AND SECOND DIVISION INJECTIONS: Mendel Nevin and Hillard R. Nevin, Novocol Chemical Manufacturing Company, Inc.

ENDODONTIA

ROOT CANAL THERAPY: S. O. Claytor, U. S. Navy Dental Corps

TREATMENT OF VITAL EXPOSED PRIMARY AND YOUNG PERMANENT TEETH and CAVITY PREPARATION AND PULPAL THERAPY IN PRIMARY TEETH: Charles A. Sweet, Jr., Oakland, Calif.

TECHNICAL EXHIBITORS

Abbott Laboratories, 1400 Sheridan Rd., North Chicago, Ill.
Acralite Company, Inc., 230 West Forty-first St., New York
Aderer, Inc., Julius, 115 West Forty-fifth St., New York
Allison Company, W. D., 1133 Burdsal Parkway, Indianapolis
American Cabinet Company, Two Rivers, Wis.
American Dental Association, 222 East Superior St., Chicago
American Dental Manufacturing & Supply Co., 830 Market St., San Francisco
American Medical Association, 535 North Dearborn St., Chicago
American Sterilizer Company, Erie, Pa.
Amurol Products Company, 410 South Michigan Ave., Chicago
Ash Sons & Company, Claudius, 127 Coit St., Irvington, N. J.
Austenal Laboratories, Inc., 5932 Wentworth Ave., Chicago

Baker & Company, Inc., 850 Passaic Ave., East Newark, N. J.
Bank of America, National Trust and Savings Assn., San Francisco
Bard-Parker Company, Inc., Danbury, Conn.
Barkmeyer Electrical Laboratory, 3301 Trinity St., Los Angeles
Boos Dental Laboratories, Henry P., 808 Nicollet Ave., Minneapolis
Brecht, F. L., 450 Sutter St., San Francisco
Bristol-Meyers Company, 630 Fifth Ave., New York
Buffalo Dental Manufacturing Company, 775 Main St., Buffalo
Burton Manufacturing Company, 3855 North Lincoln Ave., Chicago
Butler Company, John O., 540 North Lake Shore Dr., Chicago

Caulk Company, L. D., Milford, Del.
Chayes Dental Instrument Corp., 460 West Thirty-fourth St., New York
Childs Manufacturing Company, 503-6 Bankers Insurance Bldg., Macon, Ga.
Church & Dwight Company, Inc., 70 Pine St., New York
Cleveland Dental Manufacturing Company, The, 3307 Scranton Rd., S.W., Cleveland
Coe Laboratories, Inc., 6033 Wentworth Ave., Chicago
Columbia Dentoform Corporation, 131 East Twenty-third St., New York
Columbus Dental Manufacturing Company, Columbus
Condylometer Company, 2246 "K" St., San Diego, Calif.
Cook-Waite Laboratories, Inc., 1450 Broadway, New York
Corega Chemical Company, 208 St. Clair Ave., N.W., Cleveland
Cosmos Dental Products, Inc., 219 East Forty-fourth St., New York
Crescent Dental Manufacturing Company, 1837-1845 South Pulaski Rd., Chicago

Dahl Dental Supply, San Francisco
Dee Division of Handy & Harman, 1900 West Kinzie St., Chicago
Densco, Incorporated, Box 420, Denver
Dental Perfection Company, 542 West Arden Ave., Glendale, Calif.
Dental Supply Service, Box 281, Sacramento, Calif.
Denticator Company, Inc., 1055 Mission St., San Francisco
Dentists' Supply Co. of New York, 220 West Forty-second St., New York
Drucker Company, August E., 2226 Bush St., San Francisco
Du Pont de Nemours & Co., Inc., E. I., 1007 Market St., Wilmington, Del.
Durallium Products Company, 225 North Wabash Ave., Chicago
DyBasik Dentifrices Division of Albion Enterprises, 111 North La Cienega Blvd., Beverly Hills, Calif.

Eastman Kodak Company, 343 State St., Rochester, N. Y.
Easy Plastics Products, 1 Nevins St., Brooklyn
Electronic Surgical Equipment Co., Twenty-third and Arch Sts., Philadelphia
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MEETINGS OF ASSOCIATED GROUPS

The annual session of the American Dental Association provides an opportunity for many associated organizations within the dental profession to hold their yearly scientific, social and business meetings. The following is a partial list of these organizations together with the time and place of their meetings at San Francisco. Additional information may be secured from the officers listed.

American Academy of Periodontology: Palace Hotel, Oct. 13-15. Clarke E. Chamberlain, 115 North St., Peoria, Ill., secretary.

American Academy of Restorative Dentistry: St. Francis Hotel, Oct. 15-16. Kenneth A. Bignell, 25 E. Washington Blvd., Chicago, secretary.

American Association of Dental Editors: College of Physicians and Surgeons and University of California College of Dentistry, Oct. 15. E. Frank Inskipp, 209 Post St., San Francisco, president.

American Association of Dental Examiners: Mark Hopkins Hotel, Oct. 15-16. C. A. Bumstead, 924 Stuart Bldg., Lincoln, Neb., secretary.

American College of Dentists: Fairmont Hotel, Oct. 16. O. W. Brandhorst, 4952 Maryland St., St. Louis, secretary.

American Dental Assistants Association: Hotel Whitcomb, Oct. 17-20. Grayce Armstrong, 419 Punahou Place, Altadena, Calif., secretary.

American Dental Hygienists Association: St. Francis Hotel, Oct. 17-20. A. Rebekah Fisk, 1.04 N. Troy St., Arlington, Va., secretary.

American Denture Society: Mark Hopkins Hotel, Oct. 14-15. Harold L. Harris, 1550 Lincoln St., Denver, Colo., secretary.

American Society of Dentistry for Children: Drake-Wilshire Hotel (tentative), Oct. 16. E. L. Lampshire, Sharp Bldg., Lincoln, Neb., secretary.

American Society of Oral Surgeons: Sir Francis Drake Hotel, Oct. 12-15. Harry Bear, 1112 E. Clay St., Richmond, Va., secretary.

Committee to Investigate Elastic Impression Materials: St. Francis Hotel. Oct. 14. A. G. James, 409 N. Camden Dr., Beverly Hills, Calif.

Conference of State Society Officers: Fairmont Hotel, Oct. 16. Walter T. McFall, 602 Flat Iron Bldg., Asheville, N. C., president.

Past Presidents' Luncheon: Fairmont Hotel, Oct. 18. Homer C. Brown, 1816 Franklin Ave., Columbus, Ohio.

Testimonial Luncheon for R. H. Volland: Fairmont Hotel, Oct. 17. Leo W. Kramer, 55 E. Washington Blvd., Chicago, chairman.

National Association of Seventh-Day Adventist Dentists: Hotel Bellevue, Oct. 14-15. A. C. Koppel, 437 Cedar St., N.W., Washington, D. C., secretary.

MEETINGS OF FRATERNAL ORGANIZATIONS

Alpha Omega: St. Francis Hotel, Oct. 17. S. Resnick, 619 Bankers Security Bldg., Philadelphia, secretary.

Delta Sigma Delta: Palace Hotel, Oct. 14-16. P. G. Puterbaugh, Peru, Ind., secretary.

Psi Omega: Mark Hopkins, Oct. 17. E. G. Sloman, 344 Fourteenth St., San Francisco, secretary.

Xi Psi Phi: Palace Hotel, Oct. 17. William E. Koch., Jr., 508 N. Grand Blvd., secretary.

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LON W. MORREY, D.D.S., *Editor*

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EDITORIALS

SENATE REJECTS ADMINISTRATION'S PLAN TO CREATE A DEPARTMENT OF WELFARE

THE defeat of the administration's "Reorganization Plan Number 1" by the Senate on August 16 was a distinct blow to the proponents of compulsory health insurance and a victory for those who advocate the establishment of a federal department of health.

The defeated plan provided for the consolidation of federal health, education and welfare activities in a federal department of welfare. It would have raised the Federal Security Administration to departmental status and given additional powers to the present security administrator, Oscar R. Ewing, who was slated for the directorship of the department and who is a staunch advocate of compulsory health insurance.

Representatives of the American Dental Association,[1] testifying before the Senate Committee on Expenditures in the Executive Department July 21, 1949, opposed passage of the plan because "it violates a fundamental principle in good health administration in that it perpetuates the procedure of subordinating the Public Health Service to the lay control of the proposed Secretary of Welfare."

The Association is in full accord with the administration's efforts to improve efficiency and reduce federal expenditures, but it cannot favor any proposal, including Reorganization Plan Number 1, that maintains the administration of the nation's health activities in a subordinate position. The health activities of this country are so important, numerous and complex that they require the highest type of administration unfettered by lay control.

1. A.D.A. Opposes Inclusion of Health Agencies in Proposed Federal Welfare Department. J.A.D.A. 39:210 (August) 1949.

The Association, by action of the House of Delegates in 1938,[2] recommended the establishment of a federal department of health with a secretary who shall be a graduate in medicine and a member of the President's cabinet, and a first assistant secretary who shall be a graduate in dentistry. Nothing has occurred during the past 11 years to change the Association's viewpoint. It will continue to press for the establishment of a federal department of health and oppose proposals similar to those contained in Reorganization Plan Number 1.

2. Report National Health Program Committee. Transactions of the American Dental Association, 1938, p. 327.

DENTISTRY FORGES NEW WEAPONS IN WAR ON DENTAL CARIES

SLIGHTLY less than ten years ago the dental profession celebrated its one hundredth anniversary, an occasion used by dentistry throughout the world to evaluate its progress and chart its course for the coming century. Leaders in the profession at that time predicted that the same amount of effort expended in the past to improve educational and operative procedures would be devoted in the future to the prevention of dental diseases. Now that the first ten years of dentistry's second century are drawing to a close it is fitting that the profession take stock of recent achievements which may aid in transforming those predictions into realities.

First, the chemicoparasitic theory of dental caries expressed by W. D. Miller in the 1880's has been reaffirmed by present dental authorities. At a conference held at the University of Michigan in September 1947 more than 100 individuals, recognized for their interest in caries research, formulated the following definition:[1]

> Dental caries is a disease of the calcified tissues of the teeth. It is caused by acids resulting from the action of micro-organisms on carbohydrates, is characterized by a decalcification of the inorganic portion and is accompanied or followed by a disintegration of the organic substance of the tooth. The lesions of the disease predominantly occur in particular regions of the tooth, and their type is determined by the morphologic nature of the tissue in which they appear.

Second, the passage by Congress in 1948 of the dental research bill, sponsored by the Association, provided another important weapon in the profession's attack on dental disease.

Third, research workers have shown more interest in problems associated with dental disease during the past ten years than in any previous period in history. Since 1940 researchers have provided the profession with certain proved methods which will partially reduce the incidence of dental caries, and in addition have presented preliminary reports on other measures which may prove effective.

Scientific studies have shown that dental caries can be controlled in about 90 per cent of individuals by supervised reduction in the intake of sugars. From a theoretic point of view caries would be inhibited in the other 10 per cent by the elimination of

1. The Michigan Workshop on the Evaluation of Dental Caries Control Technics. *J.A.D.A.* 36:3 (Jan.) 1948.

starches and dextrins. Obviously this method of control of caries requires a high degree of cooperation between patient and dentist and considerable self discipline by the individual. Therefore, researchers are exploring other and more practical measures, including tooth brushing, the use of sodium fluoride, ammoniated dentifrices, penicillin dentifrices, chlorophyll dentifrices[2] and agents which coagulate the organic matter in enamel and dentin.

From a public health standpoint, the addition of sodium fluoride (1:1,000,000) to community drinking water promises to be the most practical method so far proposed. Several well controlled[3] experiments are now under way to determine the effectiveness of this procedure. Several years must lapse, however, before the full worth of this method is known. Exponents of the fluorination of drinking water predict that, where it is available, it will reduce the incidence of dental decay about 40 to 50 per cent. Other investigators[4] have demonstrated that the application of a 2 per cent solution of sodium fluoride to the teeth of groups of children will reduce the incidence of new caries 40 per cent.

Preliminary studies with small groups indicate that brushing teeth with an ammonium liberating dentifrice "alters the balance of power in the oral flora and permits the proteolytic types of bacteria to wage the battle against fermentation and subsequent caries activity for long periods of time."[5] These preliminary reports have resulted in the market being flooded with ammoniated dentifrices, although insufficient scientific evidence is at hand to indicate the therapeutic effectiveness of such tooth cleaners on a mass scale.

One investigator[6] reports that brushing the teeth with a dentifrice that contains penicillin reduces the lactobacilli in the mouth. The popular use of a penicillin tooth cleanser is questioned, as it might produce penicillin sensitivity.

In June 1949 two groups of investigators,[7, 8, 9, 10] working independently, presented preliminary reports which indicate that the brushing of teeth with a chlorophyll-containing dentifrice reduces the incidence of caries. At least two more years of carefully controlled study will be required before the effectiveness of this procedure is fully determined.

Limited studies by another group of investigators suggest that the chemical action which occurs during the caries process can be prevented by the use of an enzyme inhibitor.[11, 12] Menadione, or synthetic vitamin K, and glyceraldehyde have been proposed for this purpose.

Still other investigators[13, 14, 15] report that the incidence of dental caries can be

2. The "chlorophyll" which was used in the recent investigations is a mixture consisting principally of sodium salts of chemical derivatives of chlorophyll, in which copper is substituted for magnesium. Details will be supplied upon request.

3. Arnold, Francis A., Fluorine in Drinking Water: Its Effect on Dental Caries. *J.A.D.A.* 34:28 (Jan.) 1948.

4. Knutson, J. W., and Armstrong, W. D., The Effect of Topically Applied Sodium Fluoride on Dental Caries Experience. III. Report of Findings for the Third Study Year. *Pub. Health Rep.* 61:1683 (Nov. 22) 1946.

5. Kesel, Robert G., An Appraisal of Various Methods for Caries Control. *Oral Surg., Oral Med. & Oral Path.* 2:670 (May) 1949.

6. Hill, Thomas J., The Use of Penicillin in Dental Caries Control. *J. D. Res.* 27:259 (Apr.) 1948.

7. Rapp, G. W., The Effect of Water Soluble Chlorophyll "A" Derivatives on the Lactobacillus Acidophilus Count in Human Saliva. Not yet published.

8. Rapp, G. W., The Effect of Water Soluble Chlorophyll "A" Derivatives on Mouth Odors. Not yet published.

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reduced by coagulating the organic matter in enamel and exposed dentin with a 40 per cent zinc chloride solution followed by a 20 per cent potassium ferrocyanide solution. Additional studies on this procedure must be made before its effectiveness is fully determined.

The fact that most of these procedures are still in the experimental stage is of secondary importance. Of primary importance is the fact that at the beginning of its second century dentistry is directing as much energy to improving methods of preventing dental disease as to improving its methods of restoring lost tooth structures. For the first time in history dentistry can offer measures, other than operative procedures, for the prevention and control of dental caries.

POSTGRADUATE COURSES BY TELEPHONE: ELECTRONICS AIDS EDUCATION

THE nationwide telephonic lecture course scheduled for next fall and winter by the University of Illinois School of Dentistry opens a new avenue for the extension of education.[1] Through a cooperative arrangement with the American Telephone and Telegraph Company the University will furnish interested dental societies throughout the country with a series of six monthly lectures on caries control, dentistry for children, oral diagnosis and cancer control, the masticatory mechanism, dental education and public health. The lectures will originate in Chicago and be transmitted to the participating societies over facilities of the telephone company.

The progress of this educational experiment will be watched closely by dental educators and others, as it has tremendous potentialities. Should it prove as successful as its sponsors anticipate, it will supply an answer to the long unmet needs of many smaller dental societies, particularly those located in sparsely settled areas. It is regrettable that the method of transmitting lectures by telephone did not materialize earlier, as it transcends time and distance and reduces costs to a minimum. Inaugurated now, the technic may be relatively short lived, as it may be supplanted by rapidly improving television. Should this possibility ensue, historians may refer to the era of education by telephone as a constructive interlude between the age-old period of one night essayist stands and the sweeping effectiveness of televised programs.

Neither telephone nor television, however, will ever supplant entirely programs presented by essayists in person. Nor do the sponsors of such programs intend that they should. Nevertheless, both media have a distinct place in modern education. They can supplement existing postgraduate training, they can provide scientific programs for certain societies in certain areas and they can stimulate other societies to improve their programs through the use of a greater number of qualified essayists.

1. Telephone Dental Course Attracts Seventy Societies. *J.A.D.A.* 38:788 (June) 1949.

INTERNATIONAL CORRESPONDENCE

NEWS FROM GREAT BRITAIN

A protest move against establishment of a new scale of fees for dental treatment under the National Health Service has had little apparent effect among the general public. Those dentists who refused to take state patients following the 20 per cent cut in fees recently ordered by Health Minister Anuerin Bevin are, however, taking emergency cases. The effect of the protest has been limited because patients have grown used to long waits for dental appointments and charge the delay to the practitioner's heavy schedule.

In general, most of the dentists are looking forward to settlement of the present impasse between the profession and the government by autumn. It is expected that the Penman Committee report on revision of fees will aid in the settlement.

The outlook is not so bright for the hospital dental service, however. Considerable dissatisfaction over the grading of dentists in the service has arisen in connection with recent changes in the regulations.

Prior to the Health Service the majority of physicians and dentists gave their services to the hospital free. They held such titles as honorary surgeon and honorary dental surgeon which were much sought after appointments in the large hospitals. Now there are no honorary members of the staff with the exception of full time university clinical teachers who are paid by the University and not by the Ministry of Health. This new system, in addition to necessitating the use of detailed contracts indicating the number of sessions and the scope of the work the physician or dentist is to perform, calls for professional grading. This grading has not come up to the expectations of many who find themselves graded as senior hospital dental officers and not as consultants. The recognized gradings are, consultant, senior hospital officer, general practitioner, senior registrar, registrar, junior registrar and house officer.

The British Dental Association recently issued the following advice to the profession regarding the grading problem:

> "With the issue by the Ministry of Health of the proposed terms of employment of hospital medical and dental staffs it is to be expected that the Regional Hospital Boards will invite dental officers to accept appointments on a grade advised by the Grading Committee to the R.H.B.
>
> "Members of the Association are urged not to accept any grading offered unless they are completely satisfied that it properly reflects the proper status both of the appointment itself and of themselves as dental practitioners.
>
> "In all other cases members should express dissatisfaction with the grading offered to them and give notice of their desire to appeal against it.
>
> "Members are especially advised to refuse to accept grading as senior Hospital Dental Officer or a part-time General Practitioner Hospital Dental Officer on a basis of £150 ($600) per annum for one-half day per week. The first of these gradings is being used in a number of cases to avoid the admission of a title to consultant status while the second is contrary to the declared policy of the Representative Board and shows a

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differentiation in remuneration from the corresponding medical grade which is at £175 ($700) per annum per weekly session of half day."

The B.D.A. also informed the Ministry of its attitude toward the terms and conditions of service in the Hospital Service, adding that a meeting with the Minister of Health should be held to discuss stipulations which the Association finds unacceptable. Members of the medical profession have been advised to accept the contracts offered them.

Other recent activities of note to the dental profession here included the address of Kurt Thoma, Boston, Mass., at the Royal College of Surgeons. Dr. Thoma presented the annual Charles Tomes Lecture on odontogenic and osteogenic tumors of the jaws. He also was named an honorary fellow of the Royal College of Surgeons of Edinburgh. This is the highest dental honor in Scotland and his fellowship was among the first to be conferred. Surgical correction of jaw deformities was the subject of Dr. Thoma's lecture at the College.—*John R. Boyes, Newcastle Upon Tyne.*

THE NATIONAL SCENE

from The Journal's Washington Correspondent

One of the longest continuous sessions of Congress in history should be nearing its close with the approach of Labor Day. Although it is too soon at this moment to record what was achieved in the way of legislation particularly important to the dental profession, there is no question that it will be a full one when it is finally set down.

The past month, alone, witnessed these developments on Capitol Hill: passage by the Senate of bills to give the Army Dental Department greater independence, amending the Hill-Burton hospital construction act, liberalizing leave privileges of dental and other commissioned officers in Public Health Service. In addition, progress toward enactment of bills authorizing establishment of a federal program of subsidies and scholarships in dental, medical and nursing education; increasing salaries of dentists and other professional personnel in the medical department of Veterans Administration; inaugurating a federal-state program of school health service, and providing for expansion—with government funds—of local public health departments.

Most spectacular event in August, with reference to legislation of particular interest and import to the profession, was the Senate floor climax of the fierce battle over addition to President Truman's Cabinet of a Department of Welfare, which would be headed by Oscar R. Ewing with the rank of Secretary. A few weeks preceding the Senators' final vote, committee hearings had been conducted on the reorganization plan and emphatic testimony in opposition presented by representatives of the American Dental Association, American Medical Association and other national and state groups.

The threat of compulsory national health insurance, temporarily subdued but to which expression was given by several witnesses at hearings on the Department of Welfare plan, has vanished as far as the likelihood of Congressional action on the Thomas-Murray-Dingell bill in 1949 is concerned. But such partisans as Dingell and Biemiller in the House and Murray, Pepper and Humphrey in the Senate are preparing seriously for fresh assaults in the second session of the 81st Congress next year to put health insurance across.

Funds for Education Likely

As time lends perspective, the health legislation which may prove to be the most important enacted by the present session of Congress could well turn out to be the plan for federal aid to professional schools and provisions of scholarships. This is assuming, of course, that S.1453 or its counterpart in the House, HR 5940, is enacted into law before adjournment. In the waning days of August, chances of passage were quite bright. S.1453 had been favorably reported to the Senate by the Labor and Public Welfare Committee and, on the other side of Capitol Hill, the House Interstate Committee seemed kindly disposed to the plan.

Here is what the identical bills provide: To each accredited school of dentistry, a grant of $400 for each student enrolled, and an additional $400 per student enrolled in excess of average past enrollment; to each school of dental hy-

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giene, $150 per student on the same basis as dental schools; federal construction grants to assist in establishment of new schools and for improvement and expansion of existing teaching facilities; creation of a National Council on Education for the Health Professions, which will advise the Surgeon General on grants and scholarships and conduct a two-year survey of education in dentistry, medicine and the other health sciences.

In the Senate, this bill has bipartisan sponsorship, the names of Taft and Donnell along with those of Pepper, Thomas, Humphrey and Neely being on S.1453. Rep. Andrew Biemiller is attempting to gain passage by the House and indications are that he will be joined by one or more Republicans, as well as several Democratic colleagues.

Army Dental Bill Advances

Sponsored by Senator Lester Hunt (D.,Wyo.), S.2380 was passed unanimously by the Senate on August 9. This bill, giving the dental departments of Army and Air Force substantially the same degree of autonomy as Navy enjoys, replaces the earlier S. 1205, which was objectionable to the Secretary of Defense. Although public hearings on the reform were held by the House Armed Services Committee early in the summer, no action has been taken. Present signs are that the House will wait for Senate passage, then act on the Senate bill instead of moving for passage of a separate House bill.

During the fiscal year ended June 30, 1949, the Office of Naval Research administered $100,000 in dental research projects conducted at 11 institutions, according to a report by Comdr. Carl A. Schlack, Dental Corps, U. S. Navy. The grantees are as follows: University of California, University of Chicago, Columbia University, Cornell University, Georgetown University, Harvard University, University of Michigan, Massachusetts State College, University of Oklahoma, University of Pennsylvania and Tufts Dental School.

Seventeen lieutenants (junior grade), comprising the first group of Naval dental officers to be assigned to intern training, received graduation certificates on August 23. Their internship training was taken at six naval hospitals and at the Naval Dental School, Bethesda, Md. Simultaneously a new class of 44 members was launched at seven naval hospitals and the Naval Dental School. Members of this second group, like the first, will take six months of their work at the Bethesda school and six months in a hospital.

Indorsed by Veterans Administration and veterans' organizations, the bill (HR 5324) increasing salaries of all dentists, physicians and nurses in VA's Department of Medicine and Surgery was the subject of public hearings by House Veterans Committee in mid-August. O. W. Clark, Acting Veterans Administrator, informed the committee:

"It is believed that the enactment of the bill is necessary to permit the Veterans Administration to continue to attract and retain its share of medical and allied personnel in the face of increasingly favorable pay structures now being given serious consideration by the Congress for the medical personnel of the armed forces, Public Health Service, as well as medical and other personnel in the federal civil service.

The bill creates a new "chief grade" in the dental service, with a salary range of $10,000 to $11,000. Pay increases are provided for in all professional grades. Total estimated cost for the first fiscal year, if the bill is enacted, is $5,812,669, of which $4,529,480 would go to the nursing service; $1,081,093 to medical and $202,096 to the dental service.

Probability is that the Federal Trade Commission will issue its "cease and desist" order late in September against the American Dental Trade Association and some 150 affiliated companies. On July

25 they agreed not to contest an F.T.C. complaint against allegedly unfair business practices. F.T.C. Counsel on Aug. 18 submitted a report of recommendations as to what the formal order should contain and the respondents had ten days from that date to comment on these recommendations and file suggestions of their own. The trial examiner then will forward his report to members of the Commission, by whom the final order will be promulgated.

LEGISLATION

MODIFIED A.D.A. ARMY DENTAL BILL PASSES SENATE: NO IMMEDIATE ACTION TAKEN BY HOUSE

A somewhat modified version of an A.D.A. sponsored bill to provide authority commensurate with responsibility in administration of the Army and Air Force Dental Corps was passed by the Senate Aug. 9 and sent to the House. The bill (S. 2380) was assigned to the House Armed Services Committee but no immediate action was taken.

A duplicate (H.R. 6023) to the Senate approved measure was introduced in the House Aug. 17 by Representative Walter Brehm (R., Ohio) and sent to the Armed Services Committee.

In effect, the new measure follows closely Army Regulations 40-15 which were revised last summer as the result of A.D.A. requests that dental officers be allowed to administer dental activities with authority comparable to that provided medical officers. The change in regulations followed a series of meetings with top Army and Defense Department officials begun several years ago.

The bill, apparently a compromise between the opinions of A.D.A. officials and the Department of Defense, differs principally from the Association's bill in that the dental division officer is given staff advisory function instead of full command in establishment of professional policies and standards, issuance of instructions, inspections, appointments, advancement, and training, assignment and transfer of dental personnel. The measure is similar to the Navy Dental Corps bill passed by Congress in 1945 at the request of the A.D.A. Senator Lester C. Hunt (D., Wyo.) is credited with being largely responsible for piloting S. 2380 through committee and Senate.

The bill specifically creates a dental division in the Office of the Army Surgeon General and the Office of the Surgeon General of the Air Force. These division chiefs are to plan and recommend on all matters relating to dental health, and to have supervisory powers in carrying out all approved plans related to dental health. They will be responsible for the progressive development of the dental service.

Duties Set Out

Among the duties outlined in the bill for the dental division chief are establishment of professional standards and policies for dental practice, inspections and surveys, planning and recommending action on appointments, advancement, training, assignment and transfer of dental personnel. He will serve as advisor to the Surgeon General on all matters relating to dentistry.

The staff dental officer below the level of dental division chief will be responsible to the commanding officer of the post or installation "through appropriate channels." His authority and responsi-

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bility, with the exception of the "through appropriate channels" stipulation, will correspond to that of the division chief.

A provision of the A.D.A. bill which set the ratio of dental officers at two per thousand members of the Army and Air Force remains intact in the new bill. In addition to S. 2380, the original A.D.A. bill is in the hands of the House Armed Services Committee.

DEFEAT OF FEDERAL WELFARE DEPARTMENT PLAN BY SENATE GIVES RISE TO NEW LEGISLATION

Defeat by the Senate Aug. 16 of Reorganization Plan No. 1, which would have established a federal department of welfare giving Federal Security Administrator Oscar Ewing cabinet position, will result in an effort to force favorable action on the new McCarthy bill (S. 2060), designed to create a new federal department for health, education and security. The Senate Committee on Expenditures in the Executive Department, it has been learned, agreed to hold hearings on the bill if the Reorganization plan was defeated. It is unlikely, however, that these hearings will be launched before the "five-percenters" hearings are concluded.

Reaction of Mr. Ewing following the crushing vote of 60 to 32 in favor of upholding a resolution to disapprove the welfare department portion of the Congress approved general reorganization program was termed "bitter." He is not expected to resign, however, and indications are that he will continue the fight. President Truman is expected to resubmit the department of welfare plan to Congress in 1950, and possibly to make an election campaign issue of it.

A.D.A. opposition to the plan, which had to be vetoed by either the Senate or House before Aug. 20 to prevent its becoming law automatically, was presented late in July by E. Harold Gale, of Albany, N. Y., a member of the Association's Council on Legislation. He emphasized that creation of a department of welfare was a logical step in the plan to impose compulsory health insurance on the nation and that under the reorganization plan, all health services in the government would be under the direction of a layman.

Representatives of the American Medical Association and other organizations also testified against the plan.

A. D. A. AFFAIRS

NINETIETH ANNUAL SESSION TO BE LARGEST EVER HELD ON WEST COAST BY A.D.A.

The 90th annual session of the A.D.A., to be held in San Francisco, Oct. 17-20, is expected to be the largest west-coast meeting in the history of the Association. Some 8,000 to 10,000 dentists and their families are expected to attend.

William A. Garrett, of Atlanta, Ga., chairman of the Council on Scientific Session, reports that this year's essay and clinic programs will be of an "unusually high calibre." Eleven scientific sessions, a two-day clinic program including nearly 200 table clinics, a sizable display of scientific exhibits and a continuous

motion picture program will be features of the meeting, he said. The scientific sections will meet Oct. 18, 19 and 20 in eight meeting halls.

Plans for the business side of the program are complete and it is expected that the House of Delegates will hold four separate sessions in the Fairmont Hotel. The General Session also will be held there. Meetings of the Board of Trustees will begin Oct. 11 and continue through Oct. 21.

In addition to the scientific meetings to be held in the Civic Auditorium, the largest display of commercial exhibits in the Association's history will be presented there. More than 25,000 square feet of floor space has been booked by commercial exhibitors.

Special Events Planned

Special events being arranged by the Committee on Local Arrangements and the Committee on Entertainment include an "International Night" honoring Clyde E. Minges, A.D.A. president. The cocktail party and dinner are scheduled for the evening of Oct. 19 at the Palace Hotel featuring a special Hollywood floor show. Other events listed by the Committee on Entertainment include a ladies' luncheon and fashion show, a cruise on San Francisco Bay, tours of Chinatown, sightseeing bus tours and an inspection trip of Hunter's Point Navy yard including a visit to a battleship, submarine or cruiser. Reservations for all but the ladies' events are being handled by Leon Moser, entertainment chairman, 450 Sutter St., San Francisco 8. The ladies' events are being handled by Mrs. R. L. Blake, 3700 Ocean Ave., San Francisco 16.

Reservations for hotel accommodations in San Francisco still are being accepted by the Convention Housing Bureau provided they are submitted on the blank appearing on advertising pages 24 and 25 of this issue of THE JOURNAL.

Societies Arrange Trips

State and local dental societies throughout the nation have been urging their members to combine annual vacations with this year's A.D.A. session and five state societies have scheduled special trains to the coast. The Chicago Dental Society is taking reservations for a special trip by air to the convention. In general the train trips will feature stops at points of scenic and historic interest.

The Illinois train leaves from Chicago on Oct. 12, arriving in San Francisco Oct. 15 and returning Oct. 26. Reservations and information may be secured from L. W. Moloney, Burlington Route, 105 W. Adams St., Chicago 3. On Oct. 7 the New Jersey train will leave Newark and arrive in San Francisco Oct. 15. Return to Newark will be on Oct. 28. Additional information is available from Frank J. Houghton, 50 Glenwood Ave., Jersey City 6, N. J.

A train for the Ohio delegation will leave Chicago Oct. 6, arriving in San Francisco Oct. 13 and returning Oct. 24. Information may be obtained from C. W. Carrick, chairman, transportation committee, Ohio State Dental Association, Oberlin, Ohio. Dr. Carrick has stated that reservations are open to dentists from surrounding states. Another train will leave Oklahoma City Oct. 10 and return Oct. 24 under sponsorship of the Oklahoma State Dental Association. Rainbow Travel Service, 225 N. Robinson, Oklahoma City, is handling arrangements. The Texas train will leave Dallas Oct. 13 and return Oct. 24. Information and reservations may be secured from Herbert C. Wallace, district passenger agent, Burlington Route, 112 S. Field St., Dallas.

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DENTAL SOCIETIES

REPORTS INDICATE STATE AND LOCAL DENTAL SOCIETIES ARE ACTIVE IN OPPOSING S.1679

Indications that organized opposition to proposed Thomas-Murray-Dingell compulsory health insurance legislation is reaching the state, district and local levels in dental society activity are contained in reports coming to THE JOURNAL from dentists throughout the nation.

In particular, James H. Maycock, of Worcester, Mass., past-president of the Massachusetts Dental Society, has reported on a joint program on compulsory health insurance conducted recently by the Worcester District Dental Society and the Worcester District Medical Society. Also, Julian S. Bernhard, secretary of the Louisiana State Dental Society, has reported on that organization's public information campaign.

J. H. Maycock

The Worcester program, according to Dr. Maycock, was designed to "bring to all levels of community life, business, professional and industrial, the views of the city's dentists and physicians on the subject of C-H-I and allied programs involved in S.1679."

Pointing out that long-range planning is essential to the success of such a meeting, it was stated that Senator Lester C. Hunt (D., Wyo.) was the main speaker for an evening program which, with the help of the local Chamber of Commerce, was presented to a "large number" of people from in and around the city. Organization of the program was facilitated through the appointment of a joint dental-medical committee by John E. King and Joseph C. Dunphy, presidents, respectively of the dental and medical societies. The committee was headed by Dr. Maycock.

In addition to securing an outstanding speaker, Dr. Maycock reports that a carefully planned program of public relations was devised and that through this activity complete press and radio coverage was acquired. "Worcester's two newspapers and four radio stations, at the urging of the committee, allotted generously of their key space and strategic radio time and the large attendance at the meeting was largely the results of the public relations program," he said.

The interest of allied health services such as nursing, pharmacy, dental hygiene and dental assisting was utilized to reach various other groups including labor unions, women's clubs, parent-teacher organizations, and general consumer groups. Dr. Maycock reported that this approach resulted in the creation of wide general interest in the topic of compulsory health insurance.

Nearly all the attention getting activities of the day were keyed to Sen. Hunt's appearance at a noon luncheon and the evening program. Most of the afternoon was reserved for press and radio interviews. Others appearing on the evening program included Charles F. Jeff Sullivan, lieutenant governor of Massachusetts; Murray Gavel, president and William Marx, president-elect of the Massachusetts Dental Society and Drs. King and Dunphy.

Sen. Hunt's speech, which was broadcast in its entirety, was followed by a

Among those who contributed to the success of the Worcester, Mass., District Dental Society and District Medical Society program on compulsory health insurance were: (left to right) John J. Dunphy, president of the Medical Society; Senator Lester C. Hunt (D., Wyo.) the only dentist member of the U.S. Senate, and John E. King, president of the Dental Society.

round-table discussion by three news analysts and an open discussion from the floor. Keen interest in the subject was manifest throughout the program, Dr. Maycock said.

From Dr. Bernhard's report on activity in Louisiana, it is indicated that a continuing program to educate both the public and the profession to dangers of compulsory health insurance is under way at both the state and local dental society levels.

Cecil Palmer, British publisher and lecturer, was presented to an audience of about 500 through a joint effort of the American Association of Small Business and the New Orleans Dental Association, the report states, adding that several oil companies and the Louisiana State Medical Society participated in planning the program. General editorial comment was favorable.

In addition, the State Dental Association is distributing a number of pamphlets on C-H-I as well as supplying local societies with material for discussion and public speaking assignments. Special efforts also are being made to enlist the state's dentists in a letter-to-Congress writing campaign.

Dr. Bernhard's report outlines activities among district dental societies which include the use of speakers at society meetings, the distribution of special literature to dentists and the enlistment of medical and other organizations in their education programs.

The report placed particular emphasis on the fact that "most large concerns are willing and anxious to participate in a program" such as that presented to the public in New Orleans.

TOP MEETINGS SCHEDULED IN SOUTH, EAST AND MIDWEST

In the three months following the 90th annual session of the A.D.A., three of the nation's top dental meetings will be held beginning with the New Orleans Dental Conference, Nov. 13-16. The 25th greater New York dental meeting will follow on Dec. 5-9 and the Chicago Dental Society's 85th midwinter meeting will be held Feb. 6-9.

The New Orleans conference, to be held in the Roosevelt Hotel, is designed to provide advanced dental training and knowledge for all dentists in the southern states and Latin America. Six outstanding clinicians are scheduled on the program in addition to a number of table clinics and a motion picture series. Inquiries should be addressed to the New Orleans dental conference, 8117 Oak St., New Orleans 18.

The Statler Hotel will be the site of

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the greater New York meeting which features clinicians from various parts of the country in the presentation of "topics of interest to practitioners of all phases of dentistry."

A total of 48 clinics, divided into groups of 16 each, will be presented with the general sessions featuring a symposium, a panel discussion and an audience participation question and answer period. Educational and scientific films are included in the program. Request for reservations should be made through the New York Convention Bureau, 500 Park Ave., New York 22. Programs and details of the meeting will be available after Nov. 1 from the First and Second District Dental Societies of the Dental Society of the State of New York, Room 106A, Hotel Statler, New York 1.

The Chicago midwinter meeting this year will feature a diversified program designed to offer each dentist a wide range of subjects and clinicians from which to select. The meeting will be held in the Stevens Hotel. Request for hotel accommodations may be made directly to Chicago hotels or through the Chicago Dental Society, 30 N. Michigan Ave., Chicago.

CHICAGO DENTAL SOCIETY'S ESSAY CONTEST UNDER WAY

The Chicago Dental Society's ninth annual prize essay competition is now under way and authors have until Nov. 1 to submit their papers. The winner will receive, in addition to a cash award of $500, an invitation to present the paper at the Society's 85th midwinter meeting to be held in Chicago, Feb. 6-9.

Any member of the A.D.A. or other "person of scientific achievement" is eligible to enter the competition. Applications should be sent to the Chicago Dental Society, 30 N. Michigan Ave., Chicago 2.

The essay, according to the rules, must represent an original investigation and contain some new significant material of value to dentistry.

CARL O. FLAGSTAD MEMORIAL COMMITTEE IS APPOINTED

The Minnesota State Dental Association has formed a memorial committee to collect donations for a memorial to the late Carl O. Flagstad, of Minneapolis, chairman of the A.D.A. Council on Legislation. The committee is headed by Lewis W. Thom. All donations may be sent to the Carl O. Flagstad Memorial Committee, 1535 Medical Arts Building, Minneapolis 2.

DENTAL SOCIETIES TO HONOR TWO AT WEST COAST MEETINGS

Among the many dental organizations meeting just prior to the 90th annual session of the A.D.A. in San Francisco this year, the American Society of Oral Surgeons and the Alumni of Loyola University (Chicago) college of dental surgery will honor distinguished members.

The oral surgeons will conduct a testimonial luncheon for Menifee R. Howard, of Denver, Colo., a founder of the Society and one of its past-presidents. The luncheon will be held at the Sir Francis Drake Hotel, at 12:30 p.m., Oct. 14. This year marks the Society's 31st annual meeting.

Loyola's alumni will conduct a special breakfast at the St. Francis Hotel, at 8:00 a.m., Oct. 19 in honor of Robert W. McNulty, dean of the dental school and member of the A.D.A.'s Council on Dental Education.

Another affiliated group, the American Academy of Periodontology, convening Oct. 13-15, at the Palace Hotel, has extended an invitation to attend its meetings to all A.D.A. members and members of affiliated dental organizations.

Clyde E. Minges (right), president of the A.D.A., is shown aboard the U.S.S. Kearsarge during a reserve cruise to Halifax, Nova Scotia last month. With Dr. Minges on the trip were (center) Cmdr. H. B. McGinnis, the aircraft carrier's dental officer, and J. P. Burke, dean, Georgetown University dental school. Dr. Minges is civilian consultant to the Navy Surgeon General.

DENTAL EDUCATION

POSTGRADUATE COURSES TO REACH 7,600 BY TELEPHONE

Some 7,600 dentists in 141 dental societies in 38 states, the District of Columbia and Canada will participate in the University of Illinois college of dentistry's unique telephone extension course this fall. The series, titled "current advances in dentistry," will feature six subjects starting in October with caries control and ending with oral diagnosis and cancer control.

Under the direction of Saul Levy, of the dental school faculty, the telephone course was pioneered during the last two years. This year the lectures will be fed to participating societies by American Telephone and Telegraph Company from Chicago where 200 dentists will attend the courses at the school. Clear, unbroken transmission has been guaranteed.

Allan G. Brodie, dean of the college of dentistry, said that the two-hour presentations are designed to serve as monthly programs for participating dental societies. It is believed that they will be of particular value to groups which seldom are able to contact dental schools where postgraduate courses are provided.

Other subjects to be covered in the program include "pain in dentistry, the role of the masticatory mechanism in reconstructive dentistry, dentistry for children and nutrition in dentistry." The faculty will consist of prominent essayists in all fields of dentistry. Textual material required in the course will be forwarded to each participating dentist, according to the University. Slides and other material also will be available.

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FELLOWSHIPS IN PEDODONTIA AND PERIODONTIA AVAILABLE

A fellowship in children's dentistry and a fellowship in periodontia are being offered by the Georgetown University school of dentistry, according to Dean John P. Burke. Both positions are open for the 1949-50 school year.

In children's dentistry, the fellowship involves actual clinical instruction to junior and senior dental students in operative dentistry, oral pathology and fundamental orthodontics. The fellow also will participate in operation of the Children's Oral Pathology and Surgery Clinic at the University's new Medical Center.

The fellowship in periodontia will cover a 12-month period with a stipend of $200 a month. The fellow will teach in the newly expanded department of periodontia. Additional information may be secured by writing Dean Burke at the school of dentistry, Washington, D. C.

ROBERT H. W. STRANG DIRECTS SCHOOL OF DENTAL HYGIENE

Robert H. W. Strang, nationally known orthodontist and pioneer with the late Alfred C. Fones in the development of dental hygiene, has been appointed director of the University of Bridgeport's new school of dental hygiene. He will continue with his private practice in Bridgeport, Conn.

The new Fones School of Dental Hygiene will open this fall under the auspices of the University and will offer a two-year course leading to a degree of associate in science and a certificate in dental hygiene. The course meets all educational requirements of the A.D.A. Council on Dental Education, according to the University.

Dr. Strang's background in teaching dental hygienists began when he and Dr. Fones taught the system before such courses were installed in various dental schools. In addition, he has specialized in orthodontia since 1906 and has served as oral surgeon at the Bridgeport Hospital for 40 years. He is a graduate in both medicine and dentistry of the University of Pennsylvania.

TEMPLE UNIVERSITY OFFERS COURSE IN ORTHODONTICS

A two-week course in orthodontics under direction of Robert H. W. Strang will again be presented by Temple University school of dentistry from Jan. 22 to Feb. 4, according to Dean Gerald D. Timmons. Admission to the course is limited to orthodontists. Additional information and applications may be secured by writing the dental school, 3223 N. Broad St., Philadelphia 40.

UNIVERSITY OF PENNSYLVANIA ANNOUNCES COURSE ON CARIES

The University of Pennsylvania school of dentistry this year will add a new two-day postgraduate course on the prevention and control of caries to its list of postgraduate courses for the 1949-50 school year, according to Lester W. Burket, director of postgraduate courses.

The new course will be given by Louis I. Grossman, assistant professor of oral medicine, with the aid of six other teachers. The others are J. L. T. Appleton, professor of bacteriopathology; Paul E. Boyle, professor of oral histology and pathology; Robert E. DeRevere, instructor in operative dentistry; Arthur B. Gabel, professor of operative dentistry; New B. Williams, assistant professor of bacteriopathology and Raymond Werther, associate in operative dentistry. Enrollment in the course is limited to 30.

Increasing interest among both the laity and the profession in recent discoveries which give a "reasonable degree of protection against the initiation of

carious lesions of the teeth" is described by Dr. Burket as the reason for presentation of this course, designed to give in condensed form "the fundamentals of the pathogenesis, mechanism and means of control of dental caries as they are understood at present, with special emphasis on the practical application of the more effective methods."

Full information and a folder listing all of the dental school's postgraduate courses may be secured by writing Dr. Burket at the postgraduate division, University of Pennsylvania dental school, 40th and Spruce Sts., Philadelphia 4.

LOUISVILLE GENERAL HOSPITAL INTERNSHIPS OPEN IN OCTOBER

An internship in oral surgery will be available Oct. 1 at Louisville General Hospital, according to Raymond E. Myers, dean of the University of Louisville school of dentistry. The hospital maintains a full-time oral surgeon who supervises the work of a resident and two interns, he said.

A stipend of $25 a month will be furnished the intern who will receive special instruction in oral surgery. Other subjects to be covered in his tour of duty include anesthesia, pathology and exodontia. Theory and practice will be stressed in accordance with the recommendations of the American Board of Oral Surgery. Additional information may be secured by writing Dean Myers, 129 E. Broadway, Louisville, Ky.

GRADUATE AND POSTGRADUATE STUDIES ANNOUNCED BY TUFTS

A number of graduate courses in dentistry leading to a certificate and approximately 40 postgraduate refresher courses are to be offered in the 1949-50 school year by the Tufts College dental school, division of graduate and postgraduate studies.

The graduate courses, according to Arthur H. Wuehrmann, acting director of the division, will cover such subjects as orthodontics, oral pathology, oral pediatrics, oral surgery, periodontology, prosthetics and roentgenology. All these courses are designed to meet the requirements of the respective specialty boards and those interested in obtaining the M.S. degree may do so by combining their clinical courses with a major endeavor in a basic science, he said.

Postgraduate courses will be offered on the one-day-a-week or consecutive day basis, Dr. Wuehrmann said. They will start in October and continue through June. For additional information write the director, division of graduate and postgraduate studies, Tufts College dental school, 416 Huntington Ave., Boston.

OHIO STATE TO GIVE SHORT COURSES FOR POSTGRADUATES

A group of 25 one-week postgraduate courses on eleven different subjects will be given during the coming school year by the Ohio State University college of dentistry, according to Hamilton B. G. Robinson, director of the postgraduate division.

Courses to be given three times during the year include anatomy of the head and neck, removable partial dentures, full dentures, oral pathology, periodontia and roentgenology. The course in general anesthesia is scheduled for the autumn quarter only, children's dentistry and endontia in the winter only, and crown and bridge in the spring.

The autumn quarter begins with a course on anatomy of head and neck, Sept. 19-23, and is followed by anesthesia, Sept. 26-30; oral pathology, Oct. 3-7; oral surgery, Oct. 24-28; partial dentures, Oct. 31-Nov. 4; periodontia, Nov. 7-11; roentgenology, Nov. 28-Dec. 3, and full dentures, Dec. 5-9. Each class

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will be limited to an enrollment of ten. Additional information may be secured by writing the Ohio State University college of dentistry postgraduate division, Columbus 10, Ohio.

SEMINAR ON TESTING METHODS SCHEDULED FOR SAN FRANCISCO

In connection with the annual meeting of the American Association of Dental Examiners, a "seminar on testing methods in dentistry" will be held Oct. 15-16, at the Mark Hopkins Hotel, San Francisco. Henry A. Swanson, of Washington, D. C., chairman of the A.D.A. Council on Dental Museum and Registry, will be chairman.

The seminar will be designed to develop better tests and testing methods which could be employed in examining students for dental licensure. Dental examiners, a test expert and a dental school representative will appear on the program.

Shailer Peterson, secretary of the A.D.A. Council on Dental Education, will discuss the technics of testing and Gustav Rapp, of the faculty of Loyola University (Chicago) dental school, will speak on testing in dentistry with special emphasis on testing in the basic sciences. Lloyd Blauch, of the U. S. Office of Education, will discuss the application of workshop technics to the problem.

STATE LICENSING BOARDS TO HOLD EXAMINATIONS SOON

Examination for dental licensure in Texas will be held by the State Board of Dental Examiners Sept. 25-30, in Austin, according to Secretary R. T. Weber. Other Boards soon to hold examinations include Connecticut and New Jersey.

The Connecticut Dental Commission will conduct examinations in both dentistry and dental hygiene Nov. 15-19, in Hartford, and applications should be filed at least ten days before the meeting. Application blanks and additional information may be secured from Clarence G. Brooks, recorder, 302 State St., New London.

December 12-16 are the dates set aside by the New Jersey State Board of Registration and Examination in Dentistry for dental licensure examinations. Dental hygiene examinations will be held Dec. 12-13. Preliminary application may be secured by writing W. A. Wilson, secretary, 150 E. State St., Trenton 8. The preliminary application and fee must be filed 60 days in advance of the examinations.

STATE DENTAL EXAMINING OFFICERS NAMED IN OKLAHOMA

The Oklahoma State Dental Association announced recently that H. N. Wagner, of Henryetta, has been named president of the State Board of Governors of Registered Dentists. Other officers elected include O. D. Kutch, Hobart, first vice-president; John B. Cole, Norman, second vice-president and N. Dea Griffith, Oklahoma City, secretary-treasurer. Members elected to the Board are: William Davis, Canton; R. T. Oliver, Tulsa, and L. K. Turnbull, Ardmore. A total of 28 dentists successfully completed the state licensing examinations held in June.

ARMED FORCES

USAF ACCEPTS APPLICATIONS FOR DENTAL CORPS RESERVE

In line with the recent order of Air Force Chief of Staff Gen. Hoyt S. Vandenberg creating a separate Air Force Medical and Dental Service, the Air Force now is accepting and processing civilian applications for commissions in the dental corps reserve, U.S.A.F. Pre-

viously all dentists desiring Air Force duty were required to apply for Army reserve dental corps commissions.

In addition, Maj. Gen. George R. Kennebeck, who was named chief of dental service for the Air Force, was promoted from brigadier general shortly after his appointment to that position. A total of 219 dental reserve officers ranging in rank from first lieutenant to colonel also were transferred from the Department of the Army to the new Air Force.

SENIOR DENTAL STUDENTS TO RECEIVE NAVY COMMISSIONS

A limited number of dental students who agree to serve in the Navy Dental Corps for two years may be appointed ensigns in their senior year according to a recent Navy report. The students also must agree to accept appointment upon graduation as lieutenants, junior grade. Students interested in joining the program may contact the Navy recruiting office nearest their homes.

PACIFIC DENTAL INSTALLATIONS TOURED BY NAVY INSPECTOR

An inspection tour of Navy dental installations on the west coast and in the Pacific was to be undertaken late last month by Rear Adm. Alfred W. Chandler, general dental inspector for the Navy. He was to visit units at Seattle; Kodiak; Pearl Harbor; Tuitilla, Samoa; Guam; Yokosuka, Japan, and at bases in the Philippines.

NAVY DENTAL RESEARCHER ATTENDS EUROPEAN MEETINGS

Cmdr. Fred L. Losee, head of the biochemistry department, Naval Dental School, Bethesda, Md., recently presented a paper on "enamel protein" at the annual meeting of the American Dental Society of Europe, in Paris. He also participated in the first International Congress of Biochemistry at Cambridge, England, Aug. 19-25 and conferred with investigators in British dental and medical schools regarding dental research projects being conducted by the Navy.

SPECIAL COURSES FOR NAVY DENTAL OFFICERS ARE GIVEN

A new two-week general instruction course for Navy dental officers has been completed by a group of 19, six of whom are reservists, according to a Navy bulletin. The course is being given at the Great Lakes Naval Training Center.

Designed as a review for dental officers who have had some military training, the new course also is being given as general instruction and indoctrination for newly commissioned regular and reserve dental officers. A similar course is being conducted at the San Diego training center. Requests for additional information should be directed to the district commandant in your area, according to the Navy.

ARMY MEDICAL CENTER PLANS SPECIAL COURSES IN NOVEMBER

Starting in November the Army Dental Corps will conduct a two-week course in dental service operation and administration at the Army Medical Center, Washington, D. C., for National Guard and reserve officers, according to Brig Gen. Oscar P. Snyder, director of dental activities for the Army.

An identical course recently was announced and applications were heavy enough to necessitate placing the instruction on a regular basis, he said, adding that 20 dental officers recently completed the course. The instruction includes studies of the Center's dental division, field trips to the Army Institute of Pathology,

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the National Bureau of Standards and the National Institute of Dental Research in Washington.

A six-week training course for 23 R.O.T.C. cadets from Ohio State University dental school also is in progress at the Medical Center. The cadets are receiving a week of military instruction and five weeks of what the Army refers to in a press release as "on-the-job-training in the various phases of military dentistry." All those taking the course are veterans and are attending Ohio State under the G.I. bill.

Three officials of the A.D.A. met Aug. 23 with Raymond B. Allan, director of medical services for the National Military Establishment, and his deputy, Richard L. Meiling, to discuss the proposed unification of medical, dental and allied services in the Armed Forces. The Association representatives were Harry Lyons, Richmond, Va., chairman of the Special Committee on Emergency Dental Service; Rudolph H. Friedrich, chairman of the Council on Federal Government Dental Corps; and Francis J. Garvey, secretary of the Council on Legislation. Members of the Armed Forces Medical Advisory Committee which will be engaged in effecting the unification under Drs. Allan and Meiling are shown above. They are: (Seated, left to right) Paul Titus, Pittsburgh, secretary-treasurer and director, American Board of Obstetrics and Gynecology; Dr. Allen, Seattle, president of University of Washington and new director of Medical Services; Charles P. Cooper, New York, chairman of the committee and president of New York Presbyterian Hospital trustees; Dr. Meiling, Columbus, Ohio, of Ohio State University school of medicine and new deputy director of medical services; and Edward D. Churchill, Boston, former president of the American College of Surgeons. (Standing, left to right) Joseph Whelan, executive secretary of the committee, Office of the Secretary of Defense; Michael Debakey, Houston, Texas, Baylor University medical school; Daniel F. Lynch, Washington, D. C., trustee of the A.D.A.; Maurice C. Pincoff, Baltimore, University of Maryland; Howard A. Rusk, New York, New York University medical school and medical editor, New York Times; Francis J. Braceland, Rochester, Minn., University of Minnesota and the Mayo Clinic. Committee members not shown are: Walter H. Scherer, Houston, Texas, past-president of the A.D.A. and Paul R. Hawley, Chicago, director of the Blue Cross-Blue Shield.

INTERNATIONAL

11TH INTERNATIONAL DENTAL CONGRESS PLANNED IN LONDON

Plans for the 11th International Dental Congress to be held in London, England, were advanced recently when it was decided to conduct the program during the week starting July 20, 1952. The meeting probably will take place in Earls Court, a large building easily accessible by subway and other transportation.

Plans also call for ten scientific sections which will feature internationally known experts in various fields of dentistry. The papers are to be published in 1951 in the new International Dental Journal in an effort to inform in advance those who may attend. Open discussion of the papers is planned.

Operational headquarters for the Congress are being established in the headquarters of the British Dental Association, 13 Hill St., Berkeley Square, London, W.1. General secretary of the Congress is H. Parker Buchanan, secretary of the B.D.A. and honorary secretary is G. H. Leatherman, assistant honorary secretary of the Federation Dentaire Internationale.

GENERAL NEWS

NHA EXECUTIVE COMMITTEE DISSOLVED, EWING LETTER SAYS

The Executive Committee of the National Health Assembly should consider itself dissolved. This information was contained in a communication to all members of the Committee by Federal Security Administrator Oscar R. Ewing, Committee chairman.

It was stated in the letter that the work of a steering committee appointed by the full Committee had been completed. Listed among its accomplishments were publication of the proceedings of the Assembly and establishment of the National Health Council on a permanent basis so that it can continue in the promotion and planning of conferences between representatives of the health professions and lay organizations. Members of the Executive Committee included Harold Hillenbrand, A.D.A. secretary, several American Medical Association officials and representatives of a large number of other groups and organizations.

DENTISTS TO RECEIVE BROCHURE ON MOUTH CANCER FROM ACS

A special brochure titled "Mouth Cancer and the Dentist" is being prepared for release to dentists throughout the nation in October, according to Brewster S. Miller, assistant director, professional education section, American Cancer Society.

Designed especially to point up the service dentists may render in the early detection of oral cancer, the brochure discusses in detail the lesions indicating cancer or precancerous conditions, the necessary steps taken by the dentist in diagnosis of the suspicious lesions, and the precautions observed, dentally, before and after treatment has been instituted for cancer. The text is profusely illustrated in both color and black and white.

HEARST PUBLISHING COMPANY SUED BY MEDICAL RESEARCHERS

Two million-dollar libel suits against the Chicago Herald-American and the Hearst Publishing Company, ardent supporters of antivivisection, have been filed in federal court by two medical research scientists. Their suits are being backed by the National Society for Medical Research.

N. R. Brewer, of the University of Chi-

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cago, charges in his suit that the newspaper referred to him as a "torturer," a "cruel experimenter" and a "sadist." He asks "punitive and compensatory" damages. The newspaper in the other suit is charged with malicious misrepresentation of the views of Virgil H. Moon, of Wake Forest school of medicine, on animal experimentation. His complaint alleges that the newspaper quoted him as stating that the medical profession indulges in "useless dog torture."

In commenting on the suits, Anton J. Carlson, president and co-founder with Andrew C. Ivy of the N.S.M.R., said that they represent the beginning of a "fight fire with fire" policy. A nationwide legal committee has been organized by the Society to help protect the medical worker.

TRADE JOURNAL CALLS AD FOR TOOTHPASTE MISLEADING

A full-page dentifrice advertisement appearing in newspapers throughout the country which includes the statement that "Colgate Dental Cream Helps Stop Tooth Decay Before It Starts!" was called "misleading" in a recent editorial published by *Advertising Age,* a leading advertising trade publication. The claim appears to be based on what the advertisement calls an "exhaustive study on hundreds of people by eminent dental authorities" which is supposed to prove "that brushing teeth right after eating is the safe, effective way to help stop tooth decay."

By special permission, a reprint of the editorial follows:

"ADVERTISING AGE has made it its business, from time to time, to discuss, without equivocation, instances in which we believe that advertising of a misleading character may tend to destroy the value and usefulness of all advertising.

"We do not like the current campaign for Colgate Dental Cream. We do not believe this advertising will benefit the cause of advertising. On the contrary, we believe it is precisely the kind of carefully conceived double-talk which will help destroy public faith in the believability of advertising.

"We have no quarrel with the basic story told in this copy, but we have plenty of quarrel with the manner in which it is told. It will certainly tend to mislead the reader, a fact which seems not to have been overlooked when it was written and laid out.

"It seems inevitable that the careless reader will get an impression from the headline that Colgate has developed something new product-wise, and just as inevitable that the careful reader will discover that this is not so. In either case, the effect on public confidence in advertising is not likely to be enhanced.

"The shorter the run this particular copy gets, the better we shall like it."

FORTY-FIVE CANDIDATES PASS NATIONAL BOARD EXAMINATIONS

A total of 45 candidates have passed part two of the examination of the National Board of Dental Examiners held April 4-5, according to Gordon L. Teall, secretary. A list by schools of those who passed follows:

Columbia University — Jacob Katzman, Robert L. Shapiro.

Creighton University—John A. Burnwell, Edward Domalakes, Darrell W. Lewis.

Loyola University—Norman D. Hyland, William T. Welsh, Jr.

Meharry Medical College — Clyde R. Broadus, William H. Coleman, Louis B. Foulks, Leon Gant.

New York University—S. Walter Askinas, Michael A. Fierri, George C. Lutfy, Lester Schwadron, Walter H. Weinstein, Bernard Zinar.

Northwestern University — Walter M. Drozdiak, Joseph A. DuPree, Julian H. Jensen, Paul E. Klein, Louis G. Weide, Donald V. Wyant.

Tufts College—James W. Baker, Alfred L. Dienstag, Gordon M. Freeman, Harold S. Goldberg, Robert A. Leikin, Leon I. Leshay, Frederick W. McKinnon, Stanley R. Shelmire, Esther M. Wilkins, Algirdas Yurkstas.

St. Louis University—Howard F. Findley, Neil M. Roth, Arthur W. Wagner.

University of Nebraska—Wellington F. Dean, Charles I. Mohler, Jr.

University of Pennsylvania—Lee A. Krimmer, Alan P. Shapiro, Leonard Weinberg.

University of Tennessee—Robert E. Pope, Quentin M. Smith, Jr.

CIVIL SERVICE OPPORTUNITIES IN NEW YORK ARE ANNOUNCED

An open competitive examination for dentists interested in acquiring a civil service position with the City of New York will be held soon, according to Harry Strusser, director, bureau of dentistry, New York Department of Health. The examination will be conducted by the City Civil Service Commission for both full and part time positions. Additional information is available from the Commission.

Also in New York, the Department of Health is seeking an externe in dentistry, according to Dr. Strusser. The position will pay $2,100 a year. Information may be obtained from the director, bureau of dentistry, 125 Worth St., New York.

EXPENDITURES FOR DENTAL CARE SET RECORD IN 1948

Since the depression year of 1933, total expenditures for dental care have risen 313 per cent or from $276,000,000 to $864,000,000 in 1948, according to Department of Commerce figures. This new record high figure is about 10 per cent larger than the $783,000,000 spent for care in 1947 and about 84 per cent higher than the last pre-war year, 1941. Increases in total expenditures have occured each year since 1933, Department figures show.

Following is a tabulation for the last 20 years:

1929	$482,000,000	1939	$386,000,000
1930	463,000,000	1940	419,000,000
1931	408,000,000	1941	468,000,000
1932	312,000,000	1942	545,000,000
1933	276,000,000	1943	606,000,000
1934	295,000,000	1944	643,000,000
1935	302,000,000	1945	648,000,000
1936	331,000,000	1946	736,000,000
1937	350,000,000	1947	783,000,000
1938	356,000,000	1948	864,000,000

DENTAL ASSISTANTS EXAMINATION TO BE HELD IN SAN FRANCISCO

The American Dental Assistants Association has reported that applications for certification examinations to be given Oct. 15, at Lux College, San Francisco, will be accepted until Aug. 15.

Similar examinations have been held in 20 states during the past year under supervision of the American Dental Assistants Certification Board, the report states, adding that all applicants for certification must be members of the A.D.A.A.

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BOOK REVIEWS

How to Become a Doctor. By George R. Moon, M.A. First edition. 131 pages. Index. Price $2. Philadelphia: The Blakiston Company, 1949.

Many questions confront the youth of America who look forward to a career in the broad field of health service. Mr. George R. Moon, the author of *How to Become a Doctor,* is singularly well qualified to give dependable answers to these questions. For more than 20 years he has served the medical center of the University of Illinois, Chicago, as registrar, examiner and recorder. This position has given him intimate contact with thousands of applicants for admission to the study of medicine, dentistry and pharmacy.

The title of the book is a bit misleading. It is clear that by a doctor is meant a practitioner of medicine. The sub-title, however, enumerates medicine, dentistry, pharmacy, veterinarian medicine, occupational therapy, chiropody and foot surgery, optometry, hospital administration, medical illustration and the sciences.

The guide is far from complete except in medicine to which 86 of 117 pages are devoted. Here the promise of the main title is admirably fulfilled. In these days of sharp competition for admission to medical schools, no young man or woman looking forward to a medical career should be without the exact information Mr. Moon sets forth or fail to heed the suggestions and recommendations he offers.

He is forthrightly realistic and cautions the applicant to put his best foot forward upon all occasions. Sound scholarship in high school and liberal arts college is emphasized, and character, personality and professional zeal are deemed of like importance. The candidate is warned not only to submit his credentials in good form but also to be sure that his shoes are shined and his finger nails cleaned when he appears for an interview.

This excellent presentation of the steps by which one becomes a medical doctor would serve a much wider audience if it dealt more fully with the other professions. Dentistry and pharmacy are partially considered and brief reference only is made to the other callings mentioned in the sub-title. No mention is made of the mental and manual aptitude testing programs now going forward with great promise under the direction of the Council on Dental Education of the American Dental Association. Similar progressive movements in other professions are overlooked. The applicants in all of the health fields would no doubt appreciate the thorough information Mr. Moon provides for prospective physicians. Perhaps a revised and enlarged edition may later meet this need.—*Harlan H. Horner.*

Special or Dental Anatomy and Physiology and Dental Histology, Human and Comparative, Volume 2. By T. W. Widdowson, L.D.S., R.C.S. Seventh edition. 333 pages with 199 illustrations and 2 plates. Price $8.40. London, England: Staples Press Limited, 1946.

The potentialities of a good text on comparative dental anatomy are to be found in this profusely illustrated book. It does not, however, live up to the claim that it is a "textbook for students and a ready work of reference for dental practitioners" for several reasons. It fails to represent the 1946 expressions of the related sciences of genetics, taxonomy, paleontology and evolution and there is virtually no bibliography. The only references listed are a number of publications mentioned in the prefaces to the various editions as having been "consulted."

Too much prominence and emphasis is given to old and discarded theories of dentition without adequate evaluation. It is unfair to students as well as to the great scientists of the past to quote the latter without giving some suggestion of the date at which the quotations were made or of the limitations of the facts and information available at those times. Dryopithecus, the fossil anthropoid apes, gigantopithecus, meganthropus and others are not even mentioned in the chapter on primates which includes much material that could readily have been abridged in order to give more attention to the teeth of the primates.

On the other hand, the book is full of good illustrations, descriptions of dentitions and dental formulas which are of value as a quick reference. Many interesting illustrations of various mammal dentitions are included.—*A. A. Dahlberg.*

Practical Orthodontics. (Original Text by the Late Martin Dewey) Revised by George M. Anderson, D.D.S., with chapters by Bernhard Wolf Weinberger, B. Holly Broadbent, Alfred Paul Rogers, Earl W. Swinehart, Chester F. Wright, Edward A. Kitlowski. Seventh edition. 556 pages. Illustrated. Price, $10. St. Louis: The C. V. Mosby Company, 1948.

The seventh edition of *Practical Orthodontics* recently revised by George M. Anderson, including seven chapters contributed by seven competent scientific collaborators, is an enlightening encyclopedia of orthodontic instruction in fundamental concepts. It contains a compilation of advanced orthodontic information that will give the student and practitioner an understanding of numerous and varied problems. The book is noteworthy in that more than half of the written pages and illustrations are devoted to the measurement of dentofacial changes, etiology, diagnosis, differential diagnosis and analysis, tissue changes incident to tooth movement, and a consideration of occlusion of the teeth and related structures in the growth and development of the child.

The advanced knowledge contained in this book consists of precepts and fundamentals which determine when, where and how treatment should be undertaken in any given case of malocclusion.—*Howard E. Strange.*

Overweight Is Curable. By Wilfred Dorfman, M.D., and Doris Johnson, M.S. First edition. 160 pages. Index. Price $2.75. New York: The Macmillan Company, 1948.

Obese individuals are more prone to develop certain diseases than are those who maintain a normal or slightly below normal weight. For example, overweight individuals die sooner, develop heart conditions more frequently, develop hardening of the arteries more frequently and show a higher incidence of diabetes than do those with normal weights. Unfortunately, the majority of obese persons fail to appreciate their problem. Usually excess poundage is excused by saying that it runs in the family, or the affected has some glandular upset. These excuses seldom are the cause of obesity, however. Overweight generally results from the individual's unwillingness to restrict his diet to daily needs.

To obtain the patient's cooperation it is necessary to acquaint him with the factors in the problem and to offer sufficient explanation. This book provides the basis for a satisfactory explanation. It is written in understandable terms which cover a variety of broadly useful information. Discussions on the causes and effects of overweight including such subjects as longevity, heart disease, high blood pressure, diabetes and skin disease are given in addition to suggested treatment of overweight. Supplementary information on foods also is included. Considerable data are presented in tabular form so that pertinent information can be obtained at a glance. This is a useful compilation of material for the lay reader and for those who wish to suggest information in terms understandable to lay groups. For those who are interested in additional reading, a very extensive bibliography is included.—*Austin Smith.*

Your Teeth—How to Save Them. By Herbert Yahraes. 32 pages with 7 illustrations. Price 20 cents. 22 East 38th Street, New York 16, N. Y.: Public Affairs Committee, Inc., 1949.

Public Affairs Committee is a non-profit agency organized "to make available in summary and inexpensive form the result of research on economic and social problems." Because of its reputation for objectivity, the Council on Dental Health of the American Dental Association suggested that the committee utilize its talents to prepare a dental booklet for public information. The result is a readable, informative, motivating pamphlet written by Herbert Yahraes.

The pamphlet, "Your Teeth—How to Save Them," is written so that the average intelligent person will find the 32 pages easy reading. Moreover, discriminating readers will find the opinions expressed by the writer to be in accordance with current scientific information. In his discussions of possibilities for preventing decay, food for our teeth, sugar's effect on the teeth, mouth hygiene, fluorine and signs of a good dentist, the author gives evidence of careful and thorough reading of available research reports.

A questionnaire index, a summary and a bibliography round out a leaflet that will be found useful in adult education programs, in libraries, and in high schools. Placed in the dental office reception room, this leaflet will help the dentist inform his patient of desirable dental health practices.—*J. M. Wisan.*

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Germicides, Antiseptics and Disinfectants for Hospital Use. By Dewey H. Palmer. 15 pages. Price $1. New York: Hospital Bureau of Standards and Supplies, Incorporated. 1948.

This pamphlet will be of distinct value to those individuals concerned with problems of disinfection who do not have the facilities or do not wish to take the time required for a critical review of the literature. The content is of a practical nature. One of its principal virtues is that it emphasizes the limitations of chemicals which are employed at ordinary temperatures as disinfecting or sterilizing agents. The author is to be commended for attempting a precise definition of such confusing words as germicide, antiseptic, and disinfectant. The definitions are logical but whether or not they will be accepted for general usage remains an open question.

A fairly comprehensive bibliography is included but is not related to the text by specific citations. This criticism is especially pertinent with regard to those instances where there is "a marked difference of opinion about the effectiveness of a specific product." In spite of these minor criticisms, this booklet is of considerable practical value.—*Holmes T. Knighton.*

Oral Anatomy. By Harry Sicher, M.D. First edition. 529 pages with 310 illustrations, 24 in color. Index of 40 pages. Price $15. St. Louis: C. V. Mosby Company, 1949.

This volume is undoubtedly a rich source of information for dental students, practicing dentists and oral surgeons. It deals comprehensively with questions of systematic, regional and applied anatomy pertaining to practically all structures in the head and neck regions, except the brain and special sense organs. One might wonder, therefore, why the restrictive title "Oral Anatomy" was chosen for a treatise of such broad scope and scholarly attainment. It is, however, primarily a text for dentists and an appeal to their special interests evidently was intended.

The book is largely based on an original German text by Sicher and Tandler from which a majority of the figures are borrowed. It is dedicated to the memory of Professor Julius Tandler, the eminent Viennese anatomist with whom Dr. Sicher collaborated for some thirty years. The vast experience of the author both in basic anatomy and in its clinical applications is evident on practically every page. Sicher's functional, dynamic and practical approach is revealed by his consideration of growth problems wherever changing relationships occur during postnatal development.

The text is clearly written. The emphasis throughout is on good factual information rather than on theoretical considerations. It reveals careful editing and proofreading as typographical errors are exceedingly rare. Erroneous labels in the figures likewise are scarce. The illustrations, though numerous, are not wholly satisfactory. Too many halftone reproductions appear gray and flat betraying clearly the considerations of high costs entailed in the production of an attractive, first class anatomical textbook.

Concerning textual descriptions and questions of terminology one might point out that the author's evident effort to anglicize anatomical terms wherever possible leads to some difficulties, and, perhaps, a degree of confusion. For instance, the term "groove" was used equally for a large fossa or a small sulcus with the result that "temporal and infratemporal grooves" often designate large pits or areas which are generally considered as fossae in most English standard texts. Similar discrepancies in terminology and interpretation are evident in the description of other structures.

These critical remarks, however, are not intended to overshadow the good features of the book which lie in the comprehensiveness of the anatomical and practical problems discussed. Approximately three fourths of the text is devoted to descriptive anatomy. Excellent chapters deal with special subjects such as cephalometry and craniometry, facial growth, the temporomandibular articulation and the lymphatic system. Some 75 pages and numerous figures are devoted to the anatomy of the teeth and directly related problems. Much valuable information will be found in part two of the book in which practical problems of applied anatomy are fully discussed. The chapters on anesthesia, hemorrhages, propagation of dental infection and the temporomandibular articulation in malocclusion undoubtedly will prove to be of special interest.

All in all the book probably is the best in this field that has been produced in this country. For its many excellent qualities it is warmly recommended.—*A. Zimmermann.*

The Dentist and His Patient. By David Friend, George D. Kudler, Myron M. Lieb, Robert Ritt and Arthur A. Friend. First edition. 480 pages. Index and appendix. Price $10. New York: Organization Publishing Company, 1945.

This book's principal virtue lies in its difference from the average text on practice management in that emphasis is placed on some phases of dental economics that frequently are overlooked almost entirely.

The discussion of what the authors call "hazards" in dentistry is particularly good, and young dentists just starting in practice would do well to study this section with great care. The section on patient education is one of the first published studies in which this highly important phase of practice management is dealt with adequately. Pages of direct conversations are included as a means of giving specific help to beginners. No dental book in the future is going to be complete without a well detailed section on the presentation of services or patient education.

Exception to the authors' three-sitting plan of preclinical examination, charting and education is taken because it is unrealistic. Few patients would take kindly to a series of three preclinical appointments before the dentist actually begins constructive treatment. Furthermore, the paper work involved in the preclinical chart and treatment schedule makes the average veteran's case look like a primer by comparison.

The discussion of fee determination is intelligently written, but could be improved, perhaps, by adding more specific information on individual cases.

The controversial nature of the subject of practice management serves to make this book interesting and important to every dentist.—*Wallace N. Kirby.*

Child Psychiatry. By Leo Kanner, M.D. Second edition. 752 pages. Index. Price $8.50. Springfield, Illinois: Charles C Thomas, 1948.

For the great majority of dentists who are engaged either part time or full time with pedodontics, this book offers much of practical value. It might even be argued that today any dentist who ignores the psychiatric aspects of his profession is as derelict in his responsibilities as he would be if he reverted to the earlier days of the "medicine man" exodontist.

Many physicians and dentists instinctively assume that psychiatry is such a specialty that understanding of it is beyond their capabilities. This volume presents encouraging evidence that such is far from being the case. Written in a sympathetic style, it is refreshingly free from involved technical discussions. At the same time, it is a thorough, practical presentation of all that is significant in child psychiatry.

The volume's four main parts are devoted to the history of child psychiatry, basic orientation, clinical considerations and specific psychic phenomena. The last part is divided into three sections. At countless points throughout the work, the dentist will find discussions packed with important implications that can mean much in his daily practice. For example, all dentists should understand parental attitudes but how many do? How many are truly familiar with the psychotherapy involved in attitudes toward the patient, the significance of the material environment in relation to personality and behavior?

Of interest also to every dentist is an especially frank and practical consideration of the relative importance of thumb sucking and nail biting. This book can be recommended as a helpful and informative one, from both the explanatory and technical aspects.—*William W. Bolton.*

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REPORTS OF COUNCILS

BUREAU OF ECONOMIC RESEARCH AND STATISTICS

PROSPECTUS

The Bureau of Economic Research and Statistics was established under the revised Constitution and Bylaws adopted by the House of Delegates in September 1948. The Bureau is under the general direction of the Secretary of the Association. It has an advisory committee of five members, whose chairman is Leslie M. FitzGerald of Dubuque, Iowa. The Bureau was activated with the arrival of its personnel in May 1949.

The Advisory Committee to the Bureau met in Chicago on July 24. Members of the Committee discussed the need of the American Dental Association for statistical data and advised that certain studies and surveys be undertaken.

It is obviously to the advantage of the dental profession to obtain its own statistics. Lack of statistics by the British dental profession created serious problems in setting up the dental program under the National Health Service Act.

The Bureau has begun to collect pertinent data. From the federal government has come such information as consumer expenditures for dentistry and price indexes for dentistry. The number of hospitals with dental departments, by state and by type of hospital, has been obtained from the American Hospital Association. Closer approximations have been obtained to such statistics as total yearly volume of business done by dental laboratories and by dental supply houses.

But the main activity of the Bureau thus far has been planning its future. Little work has been done in dental economics and statistics since the old Committee on Economics was abolished late in 1947. Worthwhile projects which the Bureau could undertake are numerous; a selection will be necessary.

One of the most urgent projects is to determine the number and distribution of dentists. For the present, it will be possible to get the distribution by states only. In 1950, when the new American Dental Directory is scheduled for publication, the distribution by counties should be calculated. Whether county dentist-population ratios should be depicted on maps by shading schemes is a matter for further consideration. This was last done in 1942 by the Committee on Economics, primarily to answer questions connected with the war emergency. A related problem is to determine how many of the total number of living dentists are practicing.

Many other projects have been suggested by members of the central office staff and by Dr. FitzGerald, whose long interest and experience in dental economics have proved very helpful. One is to obtain the distribution of specialists, by specialty and by location. This study, of course, involves the definition of a specialist. Four criteria are available: (1) the dentist's own statement; (2) licensure, in the five states which license spe-

cialists as such; (3) membership in a recognized specialty society, and (4) certification by a recognized specialty board. The method of taking the dentist's own statement has been found wanting for two reasons: it does not provide up-to-date information because dentists cannot be canvassed yearly, and a number of dentists without a specialist's qualifications claim to have them.

Other dental personnel information for which there is a demand includes the distribution of dental hygienists, assistants and technicians; percentage of dentists employing assistants or technicians, or both; mortality rates of dentists; age distribution of dentists, and distribution of dentists employed by the federal government, by branch of service.

Within the topic of dental health, there is need for the incidence rates for various dental conditions. What percentage of the people see a dentist in a given year? Where are the fluoride-bearing waters in the United States, and what are the concentrations of fluoride in these waters? What is the average cost of providing initial dental care by age groups? The existing dental health programs—public, municipal, and county—should be summarized, as should be industrial dental set-ups.

Some of the projects suggested are of special interest to particular departments. The Council on Dental Therapeutics would like to have the names of all dentists troubled with occupational dermatitis, with a view to determining the causes and means for preventing the condition. The Business Department reports that it is in need of certain dental market statistics in connection with THE JOURNAL and other publications of the Association.

The United States Department of Commerce, with the cooperation of the American Dental Association, has undertaken a study of the incomes of dentists. Questionnaires were sent to approximately one-third of all dentists. The incomes of dental hygienists, technicians and assistants should also be determined.

At present the Bureau's staff consists of the assistant director and his secretary, so the number of these projects it can undertake is limited. Many of these studies could be greatly expedited by the use of modern tabulating equipment. For instance, the age distribution of dentists could be rapidly and accurately obtained if pertinent data were recorded on punch cards.

The foregoing list of suggested projects is only a partial one. Requests for unavailable information will continue to come in. The Bureau of Economic Research and Statistics will have to select those projects which are of most value and are feasible under the existing budget. The Bureau solicits comments from members and other interested individuals and agencies on pending and proposed projects.—*B. Duane Moen, Assistant Director.*

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PRELIMINARY COMMENTS ON DENTAL PRODUCTS

The following statements concerning products which are not accepted by the Council on Dental Therapeutics are designed to be free from controversial opinions. The Council may publish comprehensive status reports on these products whenever such reports are warranted, and will accept those which are found to be eligible for acceptance.

Topiclot

Topiclot is a white powder, stated to be a mixture of equal parts of gelatin powder and sodium alginate. It is recommended in the labeling for use as a topical hemostatic to check bleeding or tissue exudates, and is stated to be nontoxic and noninjurious to teeth, tissue or restorations.

In answer to an inquiry, the firm stated, "Topiclot is not sterile. For this reason its use is restricted to minor tissue cuts." This limitation is not noted in the advertising for the product, although the statement is made in the package insert that ". . . it is of only limited use where frank, copious bleeding is encountered."

The claim is made that "a firm tenacious gel is formed by either of the two ingredients and when the two are used together, the firmness and tenacity of the gel film are increased." According to the package insert, the gel acts in two ways —it supplies a synthetic fibrin-like mesh to facilitate the natural clotting mechanism and acts as a mechanical barrier and protective coating over traumatized tissue.

The Council is not aware of evidence adequate to establish the usefulness of Topiclot in dentistry.

Trisol

Trisol is a dark amber liquid stated to contain benzyl alcohol, 30 per cent; butyl p-aminobenzoate, 5 per cent; aluminum chloride, 2 per cent; water, 18 per cent, and alcohol, 45 per cent.

It is claimed to be a three way solution for local topical anesthesia, for shrinking oral mucosa and for reducing bleeding. The hemostatic actions are based on the astringent properties of the solution. A package insert states:

> It is recommended for anesthetizing tissues for restorative preparations and impressions, periodontia treatments, scaling and prophylaxis, and for needle insertions. Trisol is also recommended for shrinking gingival tissues to facilitate impressions, restoration setting and other operative procedures. It may also be used to reduce the vascularity of oral mucosa which in turn reduces bleeding or oozing from cut or traumatized tissues.

The distributing firm states that:

> In view of the well known nature of the ingredients of these products (Trisol and Topiclot) . . . reports in the scientific literature . . . would contribute nothing as far as technical progress is concerned . . . . by supplying these materials to numerous dentists free over a prolonged period we have obtained sufficient individual opinion to make us feel that these products are real contributions to dental therapeutics.

The Council is not aware of evidence adequate to establish the safety or usefulness of Trisol in dentistry.

Amosan Powder

Amosan Powder, "for oral hygiene," is stated to contain in each 100 Gm.: sodium perborate, dried, 70 Gm., and sodium bitartrate, dried, 30 Gm., flavored with peppermint oil and menthol. Ten polished "massaging" tooth picks, the use of which is said to be as important as the Amosan powder, are included in each trade package.

According to the distributing firm, sodium perborate and sodium bitartrate in their normal commercial state are chemically incompatible, but special processes have been devised for combining them in Amosan, and the catalytic action of sodium bitartrate is stated to greatly accelerate the release of oxygen, acting far faster and more positively than is possible with sodium perborate alone. The product is stated to contain three times as much oxygen as hydrogen peroxide, U.S.P. Hydrogen peroxide solution is undoubtedly meant here. The claimed pH of slightly above 8 for the solution of Amosan, as compared with a claimed pH of 11 for a similar solution of sodium perborate, is alleged to lessen the likelihood of irritation which at times arises from sodium perborate alone.

The product is stated to be "an aid in treating pyorrhea, gingivitis, trench mouth and allied gum infections." The claims made for it are based "on case reports . . . from upwards of 200 dentists." Scientific evidence to support the claims has not come to the attention of the Council.

The rationale of the use of sodium perborate in the treatment of Vincent's infection of the mouth and other periodontal diseases is questionable.[1]

Carodyne

Carodyne is an ointment stated to contain papain, 33.3 per cent; clove oil, 3 per cent; benzocaine, 2 per cent, and gentian violet, 0.25 per cent. The advertising claims that Carodyne relieves pain, removes necrotic tissue and promotes healing in "necrotic alveolar socket." A routine inquiry sent to the distributor of the product on November 17, 1948, remains unanswered.

It is not known whether precautions sufficient to assure a sterile product are observed in manufacture. The only clinical evidence cited in the advertising is a report of uncontrolled trial on a series of ten patients, all of whom were suffering from postextraction alveolitis.[2]

Papain is a proteolytic enzyme derived from the papaya, or pawpaw, fruit.[3] It has been used in many proprietary medicines, and is currently listed in the *National Formulary*. Allergy to papain has been reported,[4] but apparently is not common.

Faintex

This product, which is covered by U. S. patent 2,371,667, consists of a yellow liquid in frangible glass tubes, each covered by a braided fabric cover. Each tube is stated to contain 0.3 cc. of 8 to 8½ per cent ammonia, and lavender, rosemary and lemon oils. Faintex differs from aromatic ammonia spirit, U.S.P., principally in that it contains no alcohol or ammonium carbonate. Faintex is a registered trade mark.

It is marketed for use by inhalation as a respiratory and circulatory stimulant, especially for syncope. No warning statement appears on the label of a sample package purchased in February, 1949.

The directions for use on the trade package read, "Crush Faintex between the fingers, without removing braided cover. Hold to nostrils and inhale." It is

1. *A.D.R.*, ed. 14, p. 88.

2. Faillo, P. S., Proteolytic Enzyme Treatment for the Necrotic Alveolar Socket (Dry Socket). *Oral Surg., Oral Med. & Oral Path.* 1:608 (July) 1948.

3. *U. S. Dispensatory*, ed. 24, p. 818.

4. Osgood, Howard, Atopic Sensitivity to Caroid (Papain): Report of a Case With Discussion of Some of the Properties and Uses of the Drug. *J. Allergy* 16: 245 (Sept.) 1945. Abstracted in *J.A.D.A.* 33:542 (Apr. 1) 1946.

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not stated that lowering the patient's head may be more effective than the use of this type of medication, nor that the liquid should not be brought in contact with the nostrils, lest local irritation result.

The product was considered by the Council in 1947 and was found not acceptable because some of the claims were unwarranted, the directions for use were inadequate, and the name therapeutically suggestive. In the report by the Council to the firm, it was pointed out that benefits derived by the patient from the use of this type of preparation are largely psychic, and that undue reliance upon such medication might deprive him of really effective stimulation.

TOOTH POWDERS LICENSED BY THE UNIVERSITY OF ILLINOIS FOUNDATION

The ammoniated tooth powders marketed under license from the University of Illinois Foundation contain urea (carbamide), 3 per cent; dibasic ammonium phosphate, 5 per cent; bentonite, 5 per cent; calcium carbonate and other abrasives commonly used in dentifrices, about 85 per cent; flavors, and detergents. Various detergents are employed, such as sodium alkyl sulfate, sodium alkyl sulfoacetate and sulfocolaurate. The licensed brands include Amurol, Colgate, Craig-Martin, Dy-Basik, Ingram, Kolynos, Dr. Lyon's, McKesson's, Orlis, Peb-Ammo, Pepsodent and Sparkle.

The results of preliminary bacteriologic and chemical studies indicate that the use of such products may help to reduce the incidence of dental caries.[1]

A two-year controlled clinical investigation of a tooth powder containing 3 per cent of urea and 5 per cent of dibasic ammonium phosphate, conducted by the University of Illinois and the Illinois State Health Department, will be completed during 1950.[2] The clinical investigation has not progressed far enough to show whether the incidence of dental caries will be lowered by the use of such a dentifrice. All dentifrices marketed under license from the University of Illinois will be re-evaluated by the Council at the completion of the clinical investigation which is now in progress.

The Council on Dental Therapeutics has given temporary and tentative recognition to those ammoniated dentifrices which conform to its rules.[3] A list of such dentifrices will be sent without charge upon request.

1. Kesel, R. G., and others. Recent Developments in the Biologic Production of Ammonia and the Use of Ammonia and Carbamide in Caries Prevention. *Oral Surg., Oral Med. & Oral Path.* 2:439 (April) 1949.

2. Effects of Tooth Brushing To Be Studied in Illinois. (News of Dentistry) *J.A.D.A.* 35:894 (Dec. 15) 1947.

3. Council on Dental Therapeutics, American Dental Association, Report of the Annual Meeting of the Council on Dental Therapeutics. *J.A.D.A.* 37:110 (July) 1948.

CASES AND COMMENTS

Compound Bilateral Fracture of Mandible with Fatal Sequelae: Report of a Case. By R. O. Christensen, D.D.S., Oral Surgery Division, School of Dentistry, University of Minnesota, Minneapolis.

A 21 year old white soldier who was admitted to the Plastic Center, 15th General Hospital, Liege, Belgium, on January 14, 1945, as a battle casualty, was received directly from the Battalion Aid Station where an emergency tracheotomy had been performed. Examination revealed a gunshot wound (sniper's bullet) incurred on the same day during the Battle of the Bulge in the vicinity of Liege.

Clinical and extraoral roentgenogram examination revealed the following: fracture, compound, comminuted, of mandible, bilateral, severe, with considerable loss of bony tissue; wound, perforating of face, entrance right mental region, exit left commissure of the lip, lacerating the tissues severely; wound, incised of tongue, with the tongue severed laterally from its posterior base to the anterior tip of the frenum. His general condition upon arrival was good, pulse and blood pressure within normal limits, and he was cleared through the shock ward and taken to the operating room, upon arrival, for surgical treatment.

Under gas-oxygen-ether anesthesia by way of the tracheotomy tube, and intravenous thiopental sodium for induction, débridement of all soft and bony tissues was performed. The bone fragments were manipulated into normal position by fixed intramaxillary, multiple loop wiring, and held in correct anatomic position by intermaxillary elastic traction. Submental incision and drainage was established with a Penrose drain stitched to the lip of the wound. Débridement and primary closure of the wound of the tongue was then performed. The lateral edges of the tongue were freshened and closed with oo interrupted silk suture. Two mattress sutures were placed in the tongue with the suture being placed through the lumen of a catheter tube, 1.5 cm. in length, on both the dorsal and ventral surfaces and tied securely, eliminating the dead space created in the center of the tongue. Two such mattress sutures were placed running transversely across the tongue. In débridement of the soft tissues of the face, the entrance wound was closed primarily, the commissure of the lip was approximated in layers with oo chromic, and the skin approximated with oo interrupted silk suture. During the operation, the patient received 500 cc. of plasma.

The patient left the operating table in good condition. He expired twelve hours later. Cause of death was reported as irreversible shock.

The Importance of Roentgen Examination: Report of a Case. By Martin T. Siegel, D.D.S., Poughkeepsie, N. Y.

A male patient, aged 57, complained of pain in the mandibular left region and clinical examination disclosed that he wore full upper and lower dentures. Examination of the painful region showed the third molar partially erupted and causing laceration of the pericoronal area as well as part of the muccobuccal fold. The patient was under the impression that his pain was being caused by an ill fitting denture.

The roentgenogram shows that not only was the third molar involved but that an impacted supernumerary molar also was contributing to his pain. Significance of this case report is once again to show the importance of roentgen examination in addition to proper clinical examination.—*Twenty-seven Cannon Street.*

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Removal of an Impacted Cuspid: Report of a Case. By Cmdr. Charles R. Shea, D.C., U.S.N., U.S. Naval Hospital, Bremerton, Wash.

The patient was referred for removal of an upper impacted left maxillary permanent cuspid tooth. Examination showed the oral condition normal, except for the left anterior portion of the palate in which a small bulge could be felt in the bone. Roentgenographic examination, including occlusal and periapical roentgenograms, revealed an impacted cuspid in the palate with its incisal edge lying between the upper left lateral and deciduous cuspid tooth.

Under local anesthesia a flap was made on the palate from the distal of the right central incisor following the gingiva to the distal of the upper left first molar. The flap was retracted, the overlying bone was removed, and the tooth was found to be lying toward the labial (Fig. 1). A vertical incision was made on the labial from the mesial of the upper left lateral, following the gingiva around to the second bicuspid (Fig. 2). Retracting the flap, a bayonet point was placed in the impactor approximately between the left upper lateral and the deciduous cuspid so that the tooth could be forced out through the palatal side (Fig. 3). The labial and palatal flaps were replaced by interrupted sutures.

The following day the patient was comfortable, and little edema was present. In three days the sutures were removed. The patient had an uneventful recovery.

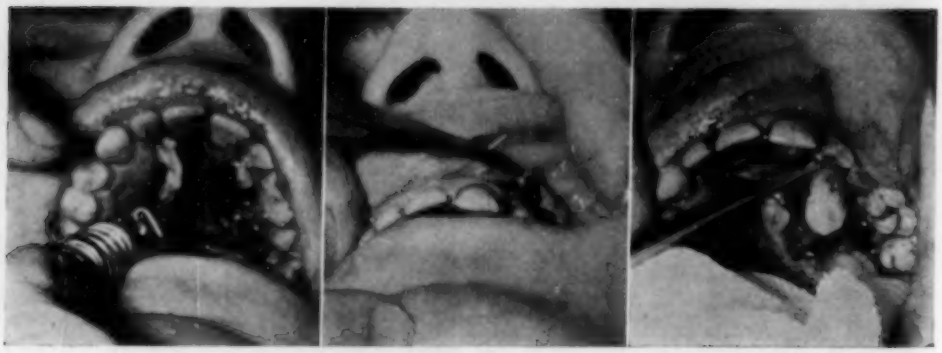

Figure 1 *Figure 2* *Figure 3*

CURRENT LITERATURE

Gingivectomy. E. Wilfred Fish. D. Gaz. 15:180, Dec. 1948.

Periodontal disease is essentially a progressively deepening detachment of the gum margins from the teeth, associated with ulceration of the subgingival epithelium. In chronic marginal gingivitis surgical resection of the interdental papillae will suffice. Pyorrhoea profunda requires more radical excision of the pocket. Complete excision is required except occasionally about anterior teeth where the patient can be taught to keep the remaining pockets clean.

Care by the patient, including use of wooden points, is emphasized. Premedication, anesthesia, technics of operation and postoperative care are discussed.—*G.D.H.*

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Abstracts of all articles follow the listing of titles.

A Comparison of Depth of Anesthesia and Toxicity of Two and Four Per Cent Procaine Hydrochloride Solution. Frank G. Everett, University of Oregon.—204.

Gold Solders for Dental Use. N. O. Taylor and C. K. Teamer, Philadelphia.—219.

The Effects of Variable Factors on Crushing Strengths of Dental Amalgams. N. O. Taylor, W. T. Sweeney, D. B. Mahler and E. J. Dinger, University of Michigan.—228.

Some Biological Characteristics of the Pathogenic Fungi Named Paracoccidioides Brasiliensis and Paracoccidioides Cerebriformis. Ricardo C. Artagaveytia-Allende, Institute de Higiene de Montevideo, Uruguay.—242.

Caries Incidence Reduction by Unsupervised Use of 27.5 Per Cent Ammonium Therapy Dentifrice. Chester J. Henschel and Leon Lieber, New York.—248.

The Effect of Penicillin on Dental Caries in Rats Fed on a Coarse Corn Diet. Harold Webman, T. J. Hill and A. H. Kniesner, Western Reserve University.—258.

Penicillin Dentifrice and Dental Caries Experience in Children. Thomas J. Hill and Albert H. Kniesner, Western Reserve University.—263.

Effect of Small Amounts of Penicillin on the Oral Bacterial Flora. Betty J. White, Albert H. Kniesner and Thomas J. Hill, Western Reserve University.—267.

Antagonistic Relationship Between Oral Organisms. Betty J. White and Thomas J. Hill, Western Reserve University.—272.

Observations on Lactobacillus Counts and Dental Caries in Mental Patients During Insulin Coma Therapy. Sholom Pearlman, William G. Sprague and Ralph C. Best, Western Reserve University and Cleveland State Hospital, Cleveland.—276.

Observations on Experimental Dental Caries. III. The Effect of Dietary Lactic Acid. Humberto Granados, Johs. Glavind and Henrik Dam, Polytechnic Institute, Copenhagen, Denmark.—282.

In Vitro Studies of the Dental Caries Inhibiting Properties of Some Selected Nitrofuran Compounds. Samuel Dreizen, Henry I. Greene and Tom D. Spies, Hillman Hospital, Birmingham, Ala., and Northwestern University.—288.

Dental Effects of Exposure to Fluoride-Bearing Dakota Sandstone Waters at Various Ages and for Various Lengths of Time. I. Status of the Permanent Teeth of 339 Children Aged 11 to 15 Years Who Used Such Water for Eighteen Months Prior to Eruption of the First Permanent Molars. A. L. Russell, South Dakota State Board of Health, Pierre, S. D.—298.

Fluoride Saturation Rate of Human Enamel. J. Straub and P. Adler, University Institute of Medical Chemistry and Stomatological Clinic, Debrecen, Hungary.—310.

Studies on the Numbers of Bacteria in the Mouth and Their Reduction by the Use of Oral Antiseptics. L. W. Slanetz and Ethan Allan Brown, University of New Hampshire, Durham, N. H., and Tufts Medical School.—313.

Halitosis: Variations in Mouth and Total Breath Odor Intensity Resulting From Prophylaxis and Antisepsis. P. P. Morris and R. R. Read, Lambert Pharmacal Company, St. Louis.—324.

A Comparison of Depth of Anesthesia and Toxicity of Two and Four Per Cent Procaine Hydrochloride Solution. Frank G. Everett.

To measure advantages, if any, of 4 per cent over 2 per cent procaine solution, depth

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of pulpal anesthesia was compared in 2 homologous teeth of the upper arch of dogs lightly anesthetized with sodium pentobarbital. Shallow occlusal cavities were prepared in each tooth to such a depth that equal minimal responses were noted when their sensitivity was tested with weak faradic current. Simultaneous stimulation of each cavity revealed that 10 minutes after nerve block with 4 per cent procaine, responses were either absent or present only with a stimulus which would produce a definite pain response in the contralateral tooth blocked with 2 per cent procaine. Clinical tests have corroborated these findings, giving objective confirmation to clinical experience.

Simultaneously, a study was made of the comparative toxicity of 2 per cent and 4 per cent procaine hydrochloride solutions. Identical drug amounts in the two concentrations were administered subcutaneously to mice and given intravenously within 18 to 25 seconds to rabbits. The results indicate an increase in the toxicity of not more than 10 per cent when concentration is increased from 2 per cent to 4 per cent and drug amounts are kept constant. The findings tend to disprove the theory of geometric progression in the toxicity of procaine hydrochloride.

Gold Solders for Dental Use. N. O. Taylor and C. K. Teamer.

The fundamental and desirable characteristics of gold alloys for use as dental solders are discussed. Available data on the ternary alloys of gold-silver-copper are used to determine compositions which should provide the best bases for dental solders.

Practical soldering tests are outlined and a rapid and convenient method of determining the fusion characteristics of solders is developed.

Suggested specifications for the compositions and physical characteristics of dental gold solders are outlined. Since the paper was first presented, in 1940, these have been adopted as a basis for specifications used by the U. S. Navy and U. S. Army for purchases of materials in this classification.

The Effects of Variable Factors on Crushing Strengths of Dental Amalgams. N. O. Taylor, W. T. Sweeney, D. B. Mahler and E. J. Dinger.

Dental amalgam is the most used material for individual tooth restoration. The physical properties, and therefore the success of amalgam used in dentistry, are dependent on the methods of manipulation. The effects of thirteen different combinations of mixing and packing procedures on the strength of 5 alloys were studied.

The effect of testing methods and time after packing on strength is included. The compressive strength was determined at various intervals of time from 20 minutes to seven days. Rate of loading was varied from 0.003 inch to 0.024 inch per minute travel of testing machine head. The strength of amalgam when hand and mechanically mixed and hand and mechanically packed, was studied. All tests were made under controlled laboratory procedure.

The stress-strain relation shows that amalgam alloys have both an elastic and a plastic range. The average modulus of elasticity was found to be 1.6×10^{-6} pounds per square inch. Strength varied with size of the specimen. Smaller specimens (4 by 8 mm.) had 2 to 7 per cent lower strength than larger ones (6 by 12 mm.). Elastic and plastic properties can be determined by loading slowly (0.003 inch per minute). It was concluded that the early strength of amalgam is so low that no stress should be applied to restorations less than one hour old, and any mastication on occlusal restorations less than six hours old may be expected to cause damage. When mechanical amalgamators are used, a specific technic must be applied for each alloy. Normal mixes varied from eight to 20 seconds among the 5 alloys tested.

The low modulus of elasticity is suggested as an important factor in the chipping of the edges of restorations and should be given some consideration.

Some Biological Characteristics of the Pathogenic Fungi Named Paracoccidioides Brasiliensis and Paracoccidioides Cerebriformis. Ricardo C. Artagaveytia-Allende.

Paracoccidioides brasiliensis and P. cerebriformis may be easily distinguished by studying the utilization of some common nitrogenous compounds and sugars. The first is pathogenic for guinea pigs whereas the second shows no pathogenic action.

P. tenuis could not be studied, but its small morphologic differences do not allow the author to distinguish it from P. brasiliensis.

The importance of the disease for odontologists is emphasized. Begliele observed in one case that dental caries and apical processes may be the portal of entry of the organism into the human body, thus producing a grave, painful and persistent systemic disease.

Caries Incidence Reduction by Unsupervised Use of 27.5 Per Cent Ammonium Therapy Dentifrice. Chester J. Henschel and Leon Lieber.

The caries-incidence experience of 220 private patients is reported in relation to the use of cosmetic and therapeutic dentifrices. The therapeutic dentifrice contained 22.5 per cent carbamide and 5 per cent dibasic ammonium phosphate, which has been found to be the highest content of active ingredients causing no irritation under average home use.

The test group of 100 patients used cosmetic dentifrices an average of 7.8 years with an average DMF/yr. of 2.39. After using the therapeutic dentifrice an average of 34.3 months, the DMF/yr. was 1.55. A control group of 50 patients used cosmetic dentifrices throughout a total of 12 years. During the pretest period their average DMF/yr. was 2.31; during the test period, 2.48.

An average caries-incidence reduction of 37.5 per cent was noted for the test group over the control group during the test period, and a 35.2 per cent reduction of the test group during the test period over its autocontrol period. A reduction was manifest in 82 per cent of the test patients. By weighting the figures to give more equal consideration to each patient instead of each DMF, the caries reduction is 41.9 per cent and 41.2 per cent respectively.

The Effect of Penicillin on Dental Caries in Rats Fed on a Coarse Corn Diet. Harold Webman, T. J. Hill and A. H. Kniesner.

One hundred and twenty-six rats were fed a coarse corn caries-producing diet (Hoppert) beginning at 20 to 30 days of age and continued for 110 days, at which time the rats were killed. Penicillin or sucrose, or both, was added in various amounts to the water supply of all groups except one.

There was no significant difference in the number of carious teeth in the water control group and the group that had 5 units of penicillin per milliliter of water. In the group which was given 1.5 per cent sucrose in water, 22.5 per cent of the teeth became carious. When the 1.5 per cent sucrose solution was supplemented with 2 units of penicillin per milliliter, 16.6 per cent of the teeth became carious, a reduction of 26 per cent. In another group 5 units of penicillin per milliliter was added to 1.5 per cent sucrose solution, and only 9.3 per cent of the teeth became carious, a reduction of 59 per cent. As increments of penicillin were added, the frequency of lactobacilli in the rat mouth flora was decreased and B. lactic aerogenes was observed more frequently.

Penicillin Dentifrice and Dental Caries Experience in Children. Thomas J. Hill and Albert H. Kniesner.

Clinical and roentgenographic oral examinations were made of institutionalized boys, aged 8 to 15 years. Initial susceptibility to dental caries was estimated by two oral lactobacillus counts. Tooth powder was distributed individually in bottles. The experimental powder contained 1,000 units of penicillin per gram; the control powder contained none.

After one year the clinical, roentgenographic and bacteriologic examinations were repeated. A significant reduction of the index was observed in 50 per cent of the experimental group. Forty per cent of the controls showed the same significant drop.

Clinical reduction of caries activity did not parallel these group differences in susceptibility classification. Lack of cooperation of all the subjects undoubtedly influenced the results obtained.

Effect of Small Amounts of Penicillin on the Oral Bacterial Flora. Betty J. White, Albert H. Kniesner and Thomas J. Hill.

This study was an attempt to determine the effect of small amounts of penicillin used in a dentifrice on the number and presence of predominating groups of aerobic organisms found in the mouth. The results indicate that continuous use of such a dentifrice results in: (1) an increase in the number of individuals with a lower lactobacillus count, (2) a reduction in the number and occurrence of penicillin-sensitive organisms in the mouth, (3) a transitory increase in the number of individuals having gram negative bacilli of the tribe Eschericheae.

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Antagonistic Relationship Between Oral Organisms. Betty J. White and Thomas J. Hill.

Because the oral flora changes to a predominance of gram negative organisms when large doses of penicillin are administered orally, it was desirable to know whether any of these organisms are antagonistic to the growth of Lactobacillus acidophilus. By means of broth cultures in wells separated from seeded agar plates by celloidin cups, or agar plugs surrounded by poured inoculated agar, L. acidophilus has been found to inhibit the growth of several organisms, mostly of the families Enterobacteriaceae and Micrococcaceae. Of the family Enterobacteriaceae which were inhibited, Aerobacter aerogenes and Escherichia coli occur most frequently in the oral flora after penicillin. Filtrates of A. aerogenes and E. coli do inhibit the growth of L. acidophilus. Only one organism, Sarcina lutea, was inhibited by growing A. aerogenes. The degree of inhibition observed was influenced by the production in the substrate of a pH more favorable to one organism than to another.

Observations on Lactobacillus Counts and Dental Caries in Mental Patients During Insulin Coma Therapy. Sholom Pearlman, William G. Sprague and Ralph C. Best.

Oral clinical and bacteriologic examinations were performed on a small number of mental patients before and after insulin hypoglycemia treatment. The sucrose solution with which coma was usually terminated had no statistically significant effect on either the incidence of new clinical caries or variations of the lactobacillus count during the period of treatment.

Patients whose salivary lactobacillus counts were below 10,000 organisms per milliliter required less than the average dose of insulin for induction of coma. This finding was statistically significant.

Observations on Experimental Dental Caries. III. The Effect of Dietary Lactic Acid. Humberto Granados, Johs. Glavind and Henrik Dam.

The effect of dietary lactic acid on dental caries activity was studied in hamsters reared for 100 days on the experimental diets. Newly weaned animals were litter-mate distributed into three groups, and were given the following rations:

Group 1: Cariogenic diet, and distilled water.

Group 2: Cariogenic diet to which had been added 0.057 ml. lactic acid (80 per cent) per 100 Gm. of food, and distilled water.

Group 3: Cariogenic diet, and distilled water to which had been added 0.050 ml. lactic acid (80 per cent) per 100 ml. of water.

In groups 2 and 3 was found gross and microscopic evidence of acid action on the various surfaces, especially in the occlusal fossae, including the bottom of them, and combined or not with caries. There was no significant difference in the incidence or extent of carious lesions among the three groups. Group 1 exhibited slightly higher incidence and extent of lesions in the maxilla than in the mandible. In group 2 the caries activity also was significantly higher in the maxilla. In group 3 the caries incidence was only slightly higher in the maxilla, but the extent of lesions was significantly higher than in in the mandible. In all the groups the lingual surfaces were the least, and the occlusal the most, affected, this being especially so in group 2. Under the conditions of the experiment, the dietary lactic acid did not play any role in the development or progress of dental caries.

In Vitro Studies of the Dental Caries Inhibiting Properties of Some Selected Nitrofuran Compounds. Samuel Dreizen, Henry I. Greene and Tom D. Spies.

It has been shown that the presence of a nitro group in position 5 of the furan ring renders the resultant compounds bacteriocidal and bacteriostatic against a number of gram positive and gram negative pathogenic bacteria. Subsequent clinical findings have demonstrated that some of the nitrofurans are effective as antibacterial agents *in vivo* as well as *in vitro*.

In this study, ten selected nitrofuran compounds were tested as inhibitors of dental caries activity in human saliva and as inhibitors of the growth and acid production of an oral strain of Lactobacillus acidophilus in yeast-extract dextrose broth. The ten compounds when added separately in 500 microgram quantities partially or completely prevented acid production in the saliva *in vitro* in 174 of the 176 caries-active samples tested. The most efficient inhibitors of acid production in human saliva *in vitro* were 5-nitro-2-fural-

dehyde-2-B-hydroxyethyl semicarbazone and 5-nitro-2-furaldehyde-2-B-methyl semicarbazone. These two compounds together with 5-nitro-2-furaldehyde-(5'-B-hydroxyethyl)-semioxamazone, 5-nitro-2-furaldoxime and the semicarbazone of 2-(5 nitrofuryl)-B-piperidinoethyl ketone hydrochloride, completely prevented the growth and acid production of the test organism for 72 hours in minimum concentrations of 3.5 to 4.0 mg. per 10 cc. of broth.

Dental Effects of Exposure to Fluoride-Bearing Dakota Sandstone Waters at Various Ages and for Various Lengths of Time. I. Status of the Permanent Teeth of 339 Children Aged 11 to 15 Years Who Used Such Water for Eighteen Months Prior to Eruption of the First Permanent Molars. A. L. Russell.

Mitchell, South Dakota, accidentally fluorinated its community water to a mean level of 1.15 ppm. fluorine for a period of 18 months subsequent to August 1935. Mouth mirror dental examinations were made of 2,140 children of this community during the winter of 1947-1948. Of this number, 339 children aged 11 to 15 years were subsequently found to have had no other fluoride exposure.

No inhibition of dental caries could be demonstrated in this group, though about 8 per cent exhibited mild or very mild dental fluorosis. The findings were interpreted as weakening the hypothesis that the caries-inhibitory effect of natural fluoride waters depends essentially on the deposition of fluorides in tooth enamel during the period of calcification.

Fluoride Saturation Rate of Human Enamel. J. Straub and P. Adler.

The fluoride saturation rate of coarsely granulated human enamel was ascertained, using an aqueous solution containing 1 mg. sodium fluoride per 100 ml. When 5 Gm. of enamel was exposed to 200 ml. of the sodium fluoride solution, approximately 40 per cent saturation was attained in 20 minutes, and maximum saturation was attained in 60 minutes. After 60 minutes some slight changes were taking place, but there was no continuous increase or decrease in the fluoride held by the enamel. The enamel was saturated by 3.6 times as much fluorine as it originally contained.

Studies on the Numbers of Bacteria in the Mouth and Their Reduction by the Use of Oral Antiseptics. L. W. Slanetz and Ethan Allan Brown.

Tryptose glucose blood agar was found to be an excellent medium for the quantitative estimation of oral bacteria. Tomato juice agar adjusted to pH 5.0 was suitable for the estimation of oral lactobacilli. The collection of saliva by chewing paraffin for a three minute period appeared to be a satisfactory method for obtaining representative samples for the estimation of the oral flora. Counts of bacteria should be based on total numbers of bacteria collected in the samples and not on the numbers per milliliter of saliva. The numbers of bacteria in the mouth generally decreased one-half to one hour after each meal. The largest numbers were usually found early in the morning, at noon and late in the evening.

Based on *in vivo* tests, glycerite of hydrogen peroxide and "Cepacol" generally produced a continual reduction in the oral bacterial flora when used twice daily as a mouth rinse. A striking reduction in the numbers of oral bacteria was obtained when two or three penicillin troches (5,000 units) were dissolved in the mouth daily, the streptococci being reduced in numbers by more than 99 per cent.

Halitosis: Variations in Mouth and Total Breath Odor Intensity Resulting From Prophylaxis and Antisepsis. P. P. Morris and R. R. Read.

Mouth and total breath odors were sampled directly from the subject and evaluated by use of an osmoscope to determine the effect of prophylaxis of the teeth and tongue and the effect of a dentifrice and an antiseptic solution. Water was used as a control. Also determined were the effects of saliva stagnation, saliva incubation, various forms of tobacco and certain foods.

It was concluded that the prophylactic measures significantly reduced odor from objectionable to unobjectionable levels for several hours, and that antiseptic and dentifrice did not mask such odors but actually removed them. The use of water had no such effect. Certain foodstuffs such as garlic produced systemic effects and thus produced odors that could not be acted on by the methods studied.

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Abramson, Milton	Newark, N. J.
Alessio, Louis Alfred	Berwyn, Ill.
Astrachan, Milton Richard	Brooklyn
Behrman, Lawrence Albert	Mohegan Lake, N. Y.
Behrman, Stanley Jack	Mohegan Lake, N. Y.
Benning, Shirl Helmts	Davis, Ill.
Berkowitz, Gerald	Utica, N. Y.
Boyle, John Elbridge	Kalamazoo, Mich.
Bradley, Arthur Melvin	Brooklyn
Bronstein, Edward	Hartford, Conn.
Brown, Ledley Norman	Tallahassee, Fla.
Brown, Robert Curwood	Tiskilwa, Ill.
Brown, William F.	Dallas, Texas
Brubaker, Robert M.	Mountain View, N. J.
Bumsted, William David	Long Beach, Cal.
Byrne, Robert C.	St. Louis
Cameron, Donald S.	St. Paul
Cameron, Robert Bruce	Hornell, N. Y.
Carlaccini, Angelo Bernard	Tarentum, Pa.
Caroon, William J., Jr.	Wilkesboro, N. C.
Carothers, Ralph N., Jr.	Medford, Ore.
Carter, Ernest Lorenza	Jackson, Tenn.
Charney, Albert	Mattapan, Mass.
Childs, Fleming Robert	Macon, Ga.
Clark, Robert F.	Binghamton, N. Y.
Cohen, Leon Benjamin	Dallas, Texas
Cotter, Leo B.	West Roxbury, Mass.
Dana, Malcolm Lewis	Brookline, Mass.
Davies, Graham Overby	Chicago
Davitz, Leonard	Baltimore
Denny, Earl Wilson	McConnelsville, Ohio
Diamond, Burton Harold	Minneapolis
Di Noia, Ferdinand W.	Port Richmond, N. Y.
Doren, Louis Sanford	Buffalo
Douglas, James R.	Overland, Mo.
Drost, Paul	Carnegie, Pa.
Eanet, Joseph Jacob	Washington, D. C.
Emerson, Caldwell George	Oklahoma City, Okla.
Epstein, Alexander	Brooklyn
Esklund, Harry Melvin	Waseca, Minn.
Fisher, Robert McPhee	Chicago
Folliard, Donald Joseph	Streator, Ill.
Foulk, Alonzo Leo	West Hollywood, Calif.
Fox, Louis	Ft. Worth, Texas
Frank, James Louis	Cicero, Ill.
Frankel, John Moayon	Louisville, Ky.
Furino, James Patrick	Rochester, N. Y.
Gabriel, Herbert Francis	Oceanside, Calif.
Gibbons, Price Allen	Pratt, Kan.
Glascock, John G.	Los Angeles
Goldman, Melvin	Worcester, Mass.
Goodman, William R.	Cedar Hill, Tenn.
Goris, Donald Stuart	Grand Rapids, Mich.
Gossler, Richard Henry	Pawtucket, R. I.
Grant, Ben Ely	Glendale, Calif.
Haenszel, Frederick Allen	Buffalo
Hagood, Charles Scott	Crestview, Fla.
Hall, Robert Curt	Forest Hills, N. Y.
Hemphill, Charles Binion	Chicago
Hord, David Fletcher, Jr.	Kings Mountain, N. C.
Inman, Marlin R.	Boonville, Ind.
Kanner, Martin Herbert	Brooklyn
Kaye, Jerome	Brooklyn
Kerson, Jerome	Bronx, N. Y.
Klavan, Bennett	Chicago
Klein, Jennings B.	De Witt, Neb.
Knowlton, John Paul	Seattle
Kraucunas, Frank	Lowell, Mass.
Kugiya, Daniel Masayuki	Honolulu, T. H.
Lea, Jack	Brooklyn
Leach, Dennis E.	Buchannon, W. Va.
Lee, Kai Ling	San Francisco
Lee, William Daniel	Los Angeles
Legierski, Leo Michael	Buffalo
Libby, Howard Randolph	Brookline, Mass.
Lichtenstein, Harry	New York
Linaberry, William Harold	Springfield, Pa.
Lisansky, Milton	Bronx, N. Y.
Lucas, Lawrence Eugene	Chicago
Lynch, Howell Jackson	Murfreesboro, Tenn.

Mack, Harry E., III	Kirkwood, Mo.
Malone, Anthony John	Chicago
Massucco, Joseph Raymond	Bellows Falls, Vt.
Mayer, Arnold Myron	San Francisco
Messinger, Samuel Stephen	New York
Metcalfe, James Theadore	Little Rock, Ark.
Moffett, Coleman Jefferson	Bala-Cynwyd, Pa.
Molina, Samuel R.	La Union, Philippines
O'Connor, John Francis	Chicago
Olendorf, James Carr	Decatur, Ill.
Pagano, Salvatore John	St. Louis
Parman, Glarner Gasser	Milwaukee
Potters, Milton	Roselle, N. J.
Quinn, Charles Martin	Elkton, Mich.
Rakow, Bernard A. L.	Brooklyn
Ramirez, Mario Felix	San German, Puerto Rico
Rau, Martin Henry	Albany, N. Y.
Ray, Kenneth Crawford	Yakima, Wash.
Raymon, Harold	Huntington, N. Y.
Reed, William Marion	Lexington, Oglethorpe, Ga.
Renna, Anthony William	Brooklyn
Richert, Traver Oliver	Portland, Ore.
Rinck, Carlton Frederick	Buffalo
Robinson, Ruselle Willie	Rochester, N. Y.
Rodwell, Percy C., Jr.	Orangeburg, S. C.
Rogoff, Abraham	Brooklyn
Sackett, Lee Monte	Mt. Rainier, Md.
Sandberg, Floyd Arlinton	Minneapolis
Schiefer, William Ernest	San Diego, Calif.
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Shann, Norman Lee	Hollywood, Calif.
Shapiro, Robert Leonard	Springfield, Mass.
Siegel, Herbert	Bronx, N. Y.
Small, Clifford Thomas	New York
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Spadola, Joseph W., Jr.	Morristown, N. J.
Spector, Daniel H.	New York
Spigner, Philip	Brooklyn
Stern, Arnold	Pittsburgh
Stokes, Ronimus R. T.	Roxbury, Mass.
Streem, Jerome Armand	University Heights, Ohio
Tappan, Charles Warren	Pueblo, Colo.
Thomason, James Wiley	Midway, Ala.
Todaro, Carmelo John	New York
Toll, Samuel Morris	Beverly, Mass.
Ulrich, Clyde William	Peoria, Ill.
Unger, Robert Michael	Chicago
Uyemura, George Haruo	Denver
Vinzant, Samuel Benton	Dallas, Texas
Warninger, Bruce Merriam	Yakima, Wash.
Weisenfeld, Arthur	Brooklyn
Wexler, Adolph	New York
Wiggins, Joseph H.	Ville Platte, La.
Wood, Robert Douglas	Monroe, La.

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DEATHS

Adams, A. J., Durham, N.C.; Atlanta Dental College, 1911; died June 10; aged 70.

Alvord, Sherman S., Buffalo; School of Dentistry, University of Buffalo, 1919; died June 18; aged 52.

Babcock, Adelbert H., New York; College of Dental Surgery, University of Michigan, 1894; died July 6; aged 76.

Babcock, Frank C., Appleton, Wis.; Chicago College of Dental Surgery, 1897; died June 24; aged 74.

Bandy, Claude W., Moline, Ill.; Chicago College of Dental Surgery, 1902; died June 30.

Banks, George H., Springfield, Mass; School of Dentistry, University of Pennsylvania, 1901; died July 6.

Barnwell, Oscar L., Atlanta, Ga.; Southern Dental College, 1907; died May 31.

Barret, Walter M., Palo Alto, Calif.; College of Dentistry, University of California, 1926; died June 7; aged 62.

Bien, Edward R., Detroit; School of Dentistry, University of Detroit, 1939; died June 10.

Bond, Francis H., Hazleton, Pa.; School of Dentistry, University of Pennsylvania, 1892; died June 6; aged 83.

Bowles, J. G., Hazard, Ky.; School of Dentistry, University of Louisville, 1905; died June 28; aged 67.

Bridges, Fred B., Brazil, Ind.; Indiana Dental College, 1909; died July 11.

Bush, Roy A., Worcester, Mass; School of Dentistry, University of Pennsylvania, 1899; died June 15; aged 70.

Colter, Roy B., Marinette, Wis.; Philadelphia Dental College, 1902; died June 24; aged 69.

Cressman, Howard B., Philadelphia; School of Dentistry, University of Pennsylvania, 1899; died July 6.

Delk, William, Cambridge City, Ind.; School of Dentistry, Indiana University, 1925; died June 28; aged 48.

Driscoll, M. J., Centralia, Ill.; School of Dentistry, University of Louisville, 1904; died July 6; aged 79.

Dunne, F. Raymond, Chicago; Chicago College of Dental Surgery, 1916; died May 31; aged 55.

Ferguson, Kenneth R., Cedar Rapids, Iowa; College of Dentistry, University of Iowa, 1923; died June 29; aged 51.

Good, Samuel L., Brielle, N.J.; died June 27; aged 83.

Hamill, Lloyd, Olathe, Kan.; Kansas City Dental College, 1887; died June 10; aged 74.

Hanrahan, William G., Springfield, N.J.; School of Dentistry, University of Pennsylvania, 1902; died June 23.

Hansen, Harold J., La Crosse, Wis.; Chicago College of Dental Surgery, 1900; died July 4; aged 79.

Hauge, I. B., St. Cloud, Minn.; died June 20.

Herron, F. Basil, Fairmont, W. Va.; Baltimore College of Dental Surgery, 1914; died June 28.

Hillenbrand, George H., Chicago; Dental School, Northwestern University, 1898; died June 8; aged 74.

Horan, William H., Troy, N.Y.; died April 26.

Howard, Orvyl T., Portland, Ore.; School of Dentistry, North Pacific College of Oregon, 1929; died June 8.

Howell, Robert A., Gallipolis, Ohio; died June 1; aged 87.

Hyman, Harry, New York; New York College of Dentistry, 1906; died July 1; aged 61.

Jaco, Charles H., Philadelphia; School of Dentistry, University of Pennsylvania, 1904; died April 16.

Jacoby, Paul T., Niles, Ohio; died May 13; aged 51.

Jenkins, James L., Jackson, Mo.; School of Dentistry, Washington University, 1893; died May 27; aged 78.

Johnson, Adrian T., Forest Lake, Minn.; College of Dentistry, University of Minnesota, 1939; died April 22; aged 39.

Jones, Howard L., Detroit; College of Dental Surgery, University of Michigan, 1913; died July 5; aged 67.

Jones, Warren R., Mansfield, Mass.; Tufts College Dental School, 1906; died June 3; aged 65.

Just, Alfred, Reedsville, Wis.; Dental School, Marquette University, 1923; died June 12; aged 49.

Kaar, Charles W., Burley, Idaho; Lincoln Dental College of Cotner University, 1908; died June 20; aged 67.

Keown, George J., Philadelphia; Philadelphia Dental College, 1915; died July 21.

Lane, D. Deronda, Montrose, Calif.; College of Dentistry, University of Iowa, 1925; died April 12.

Lenzen, Edward J., St. Louis; School of Dentistry, University of Washington, 1904; died May 23; aged 68.

Lighthall, Earl, Lakeside, Calif.; School of Dentistry, University of Denver, 1918; died March 23; aged 57.

Lombard, Henry F., Greenfield, Mass.; School of Dentistry, University of Pennsylvania, 1907; died April 23; aged 54.

Marshall, Leon M., Columbus, Ohio; Department of Dentistry, Starling-Ohio Medical College, 1904; died May 4; aged 68.

Massey, David L., Birmingham, Ala.; Birmingham Dental College, 1902; died June 6; aged 70.

Matthew, Jules R., Elkhart, Ind.; Dental School, Northwestern University, 1919; died May 27.

McCarthy, William E., Troy, N.Y.; Pennsylvania College of Dental Surgery, 1892; died July 5.

McClanahan, A. A., Springfield, Tenn.; School of Dentistry, Vanderbilt University, 1889; died April 26; aged 88.

McFarland, Kansas City, Mo.; Western Dental College, 1902; died June 28; aged 69.

Meyer, E. Alvin, New York; School of Dental and Oral Surgery, Columbia University, 1924; died June 16; aged 48.

Miller, Elmon H., Portland, Ore.; School of Dentistry, North Pacific College of Oregon, 1906; died May 7; aged 66.

Moffitt, John J., Harrisburg, Pa.; School of Dentistry, University of Pennsylvania, 1899; died June 26; aged 74.

Moore, Dwight E., Lone Rock, Wis.; Dental School, Northwestern University, 1903; died June 10; aged 75.

Moore, Thomas T., Columbia, S.C.; School of Dentistry, University of Pennsylvania, 1901; died May 20; aged 69.

Moser, Arthur E., St. Louis; School of Dentistry, Washington University, 1892; died June 3; aged 90.

Mullally, Alfred A., Milton, Mass.; died June 9; aged 57.

Murphy, John W., Fairmount, W. Va.; Ohio College of Dental Surgery, Dental Department of the University of Cincinnati, 1915; died April 22; aged 56.

Murray, Robert, Buffalo; School of Dentistry, University of Buffalo, 1898; died June 14; aged 82.

Newman, J. W., Aurora, Neb.; Lincoln Dental College of Cotner University, 1911; died June 19; aged 62.

O'Connor, Thomas M., Chicago; Chicago College of Dental Surgery, 1902; died May 13; aged 79.

Packard, Judson E., Sioux City, Iowa; College of Dentistry, University of Iowa, 1912; died May 6.

Pagan, John M., Great Falls, S.C.; Baltimore College of Dental Surgery, University of Maryland, 1909; died May 15; aged 74.

Park, Harry M., Mount Kisco, N.Y.; New York College of Dentistry, 1902; died July 3; aged 70.

Pearson, William H., Norfolk, Va.; Dental Department, University College of Medicine, 1899; died May 20; aged 71.

Peres, Robert, Passaic, N.J.; Dental School, Harvard University, 1923; died June 25; aged 49.

Quattlebaum, Edwin C., Columbia, S.C.; Philadelphia Dental College, 1891; died May 11; aged 85.

Rehrig, J. Edward, Bangor, Pa.; School of Dentistry, University of Pennsylvania, 1908; died May 7; aged 64.

Reisse, Edward C., University City, Mo.; School of Dentistry, Washington University; died May 4; aged 76.

Rowe, Clarence E., Lakeport, N.H.; Baltimore College of Dental Surgery, 1900; died June 8; aged 73.

Rozzelle, Dowd, Washington, D.C.; died April 26; aged 69.

Ruhlen, Charles A., Cushing, Okla.; College of Dentistry, Ohio Medical University, 1900; died April 28; aged 72.

Russell, Harry J., Des Moines, Iowa; Des Moines College of Dental Surgery, 1905; died June 6; aged 73.

Rust, Herbert E., Rockford, Ill.; Chicago College of Dental Surgery, 1916; died June 2; aged 55.

Sauter, William, Corryville, Ohio; Ohio College of Dental Surgery, University of Cincinnati, 1901; died May 3; aged 73.

Schlottman, E. V., Rochester, N.Y.; School of Dentistry, University of Pennsylvania, 1929; died May 2.

Schocket, George J., Newark, N.J.; died June 8; aged 45.

Schropp, Raymond J., Lebanon, Pa.; School of Dentistry, Temple University, 1907; died June 23; aged 69.

Sharp, Charles H., Lockport, N.Y.; School of Dentistry, University of Louisville, 1891; died June 16; aged 84.

Shocket, George J., Deal, N.J.; died June 8; aged 45.

Singmaster, Orvis, Cincinnati; Ohio College of Dental Surgery, University of Cincinnati, 1903; died May 15; aged 79.

Smalley, A. Dwight, Portland, Ore.; died April 25; aged 67.

Smith, Joseph L., Denver; School of Dentistry, Uniiversity of Denver, 1906; died May 14; aged 71.

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Full Denture Prosthesis: Carl O. Boucher, College of Dentistry, Ohio State University, Columbus 10, Ohio.

Hospital Dental Service: Sanford M. Moose, 450 Sutter St., San Francisco.

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Roentgenology: Walter S. Thompson, 727 W. 7th St., Los Angeles.

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THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION
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Len W. Morrey, Editor **John J. Hollister, Business Manager**

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UNIVERSITY OF MICHIGAN LIBRARIES

ANNOUNCEMENTS

MEETINGS OF STATE SOCIETIES

State	Date	Place	Secretary	Address
Alabama	May 1-3, 1950	Biloxi, Miss.	G. W. Matthews	1922 Tenth Ave., S., Birmingham 5
Arizona			H. G. DeWolf	Valley National Bank Bldg. Tucson
Arkansas			D. M. Hamm	White Bldg., Clarksville
California	April 24-26, 1950	San Francisco	L. R. Ludwigsen	450 Sutter St., San Francisco
S. California	April 3-5, 1950	Los Angeles	M. E. Ralston	Medico-Dental Bldg., Pomona
Colorado	Oct. 4-7, 1950	Colorado Springs	R. A. Downs	724 Republic Bldg., Denver 2
Connecticut			E. S. Arnold	37 Linnard Rd., W. Hartford
Delaware			Norbert L. Gladnick	1009 Madison St., Wilmington
D. of Columbia			K. H. Wood	202-1835 Eye St., N. W., Washington
Florida	Nov. 10-12	Palm Beach	L. M. Schulstad	Professional Bldg., Bradenton
Georgia	Nov. 13-15	Savannah	J. M. Heard, Jr.	Persons Bldg., Macon
Hawaii			J. H. Dawe	P. O. Box 39, Honolulu 10
Idaho			H. R. Packard	Idaho Falls
Illinois			P. W. Clopper	623 Jefferson Bldg., Peoria 2
Indiana	May 15-17, 1950	Indianapolis	E. E. Ewbank	Kingman
Iowa	May 1-3, 1950	Des Moines	H. I. Wilson	639 Insurance Exchange, Des Moines
Kansas	May 7-10, 1950	Kansas City, Mo.	F. A. Richmond	1008 Huron Bldg., Kansas City
Kentucky	Mar. 29-31, 1950	Louisville	A. B. Coxwell	1976 Douglass Blvd., Louisville
Louisiana	April 14-16, 1950	Monroe	J. S. Bernhard	407 Medical Arts Bldg., Shreveport
Maine			P. W. Anderson	32 Deering St., Portland 3
Maryland	May 1-3, 1950	Baltimore	E. L. Pessagno, Jr.	415 Medical Arts Bldg., Baltimore 1
Massachusetts	May 1-4, 1950	Boston	A. M. Bommer	349 Broadway, Revere
Michigan	April 24-26, 1950	Detroit	F. Wertheimer	Michigan Dept. of Health, Lansing
Minnesota	Feb. 20-22, 1950	St. Paul	C. V. E. Cassel	242 Lowry Medical Arts Bldg., St. Paul
Mississippi	June 11-14, 1950	Biloxi	F. C. Sneed	Onyka
Missouri	May 7-10, 1950	Kansas City	R. R. Rhoades	201 Merchants Bank Bldg., Jefferson City
Montana			C. S. Renouard	304 Phoenix Bldg., Butte
Nebraska	May 8-10, 1950	Omaha	F. A. Pierson	Federal Securities Bldg., Lincoln
Nevada	May 9-10, 1950	Las Vegas	Clifford A. Paize	Boggs Bldg., Las Vegas
New Hampshire			F. E. Williams	814 Elm St., Manchester
New Jersey	April 26-28, 1950	Atlantic City	J. G. Carr	407 Cooper St., Camden
New Mexico	May 22-24, 1950	Albuquerque	J. S. Eilar	First National Bank Bldg., Albuquerque
New York	June 5-8, 1950	New York	C. A. Wilkie	1 Hanson Place, Brooklyn
North Carolina	May 18-20, 1950	Pinehurst	R. F. Hunt	Rose Drug Co., Bldg., Rocky Mount
North Dakota	May 7-10, 1950	Fargo	A. L. Smeby	Northwood
Ohio	Nov. 13-16	Columbus	E. G. Jones	185 E. State St., Columbus
Oklahoma	April 16-19, 1950	Tulsa	F. H. Binkley	Hennessey
Oregon	Mar. 6-8, 1950	Portland	H. C. Fixott, Jr.	Medical Dental Bldg., Portland
Panama Canal Zone			R. O. Leon	Box 1094, Ancon
Pennsylvania			J. Wittek	217 State St., Harrisburg
Puerto Rico			F. Guerra	Avenida Ponce de Leon, Santurce
Rhode Island	Jan. 17-18, 1950	Providence	J. F. Colgan	838 Newport Ave., Pawtucket
South Carolina			J. R. Owings	201 E. North St., Greenville
South Dakota	May 14-16, 1950	Huron	E. W. Elmen	Sioux Falls
Tennessee	May 8-10, 1950	Chattanooga	E. J. Justis	Exchange Bldg., Memphis
Texas	April 23-27, 1950	Dallas	W. Ogle	313 Medical Arts Bldg., Dallas
Utah			H. R. Nordberg	807 Tribune-Telegram Bldg., Salt Lake City
Vermont	May 22-24, 1950	Woodstock	J. A. Larrow	Middlebury
Virginia	April 17-19, 1950	Roanoke	J. E. John	804 Medical Arts Bldg., Roanoke
Washington			F. J. Dingler	1502 Medical-Dental Bldg., Seattle 1
West Virginia	May 15-17, 1950	Huntington	A. B. Drake	Huntington
Wisconsin	April 11-13, 1950	Milwaukee	R. A. Mason	964 N. 27th St., Milwaukee 2
Wyoming			T. A. Ward	Casper

MEETINGS OF STATE BOARDS OF DENTAL EXAMINERS

State	Date	Place	Secretary	Address
Indiana	Nov. 14-17*	Indianapolis	C. A. Frech	Gary National Bank Bldg., Gary
Michigan	Jan. 29-Feb. 4, 1950 June 11-June 17, 1950	Ann Arbor	J. L. Champagne	502 David Whitney Bldg., Detroit 26
New Jersey	Dec. 12-16† Dec. 12-13‡ June 5-9, 1950† June 5-6, 1950‡		W. A. Wilson	150 E. State St., Trenton 8
New York	Sept. 30-Oct. 1 Oct. 4-7	New York Buffalo	David W. Beier	23 S. Pearl St., Albany 7
Ohio	Oct. 24-28	Columbus	E. D. Lowry	79 E. State St., Columbus 15
Oregon	Nov. 7-10*		F. L. Utter	506 Pioneer Trust Bldg., Salem
Rhode Island	Dec. 6-7	Providence	F. M. Hackett	State Office Bldg., Divn. Professional Regulation, Providence

*Dentistry and dental hygiene.
†Dentistry.
‡Dental Hygiene.

OTHER MEETINGS

Name	Date	City	Secy. or Chmn.	Address
American Academy of Pedodontics	Oct. 14-15	San Francisco	E. C. Schildwachter Secy.	6831 Seville Ave., Huntington Park, Calif.
American Academy of Periodontology, Annual Meeting	Oct. 13-15	San Francisco	C. E. Chamberlain Secy.	115 North St., Peoria
American Association of Dental Examiners	Oct. 15-16	San Francisco	C. A. Bumstead Secy.	924 Stuart Bldg., Lincoln, Neb.
American Association of Public Health Dentists, Annual Meeting	Oct. 16	San Francisco	C. L. Sebelius Secy.	Tennessee Dept. of Public Health, Nashville 3, Tenn.
American College of Dentists	Oct. 16	San Francisco	O. W. Brandhorst Secy.	4952 Maryland Ave., St. Louis 8
American Dental Assistants Association, Silver Anniversary	Oct. 17-20*	San Francisco	Mary L. Martin	610 Jefferson Ave., La Porte, Ind.
American Dental Association, Ninetieth Annual Meeting	Oct. 17-20	San Francisco	H. Hillenbrand Secy.	222 E. Superior St., Chicago 11
American Dental Hygienists' Association, Twenty-Sixth Annual Meeting	Oct. 17-21	San Francisco	A. Rebekah Fisk Secy.	1830 Eye St., N. W., Washington, D. C.
American Dental Laboratories Association, Second Annual Meeting	Nov. 18-20	Cleveland	Ken Gall Chm. Program Committee	560 Rose Bldg., Cleveland 15
American Public Health Association, Seventy-Seventh Annual Meeting	Oct. 23	New York	R. M. Atwater Secy.	1790 Broadway, New York 19
American Society for the Advancement of General Anesthesia in Dentistry, Fall Meeting	Oct. 24	New York	M. H. Feldman Exec. Secy.	730 Fifth Ave., New York
American Society of Oral Surgeons, Thirty-First Annual Meeting	Oct. 12-15	San Francisco	Harry Bear Secy.	1112 E. Clay St., Richmond 19
Association of American Women Dentists	Oct. 17	San Francisco	Dora T. Smith Secy.	Cheda Bldg., San Anselmo, Calif.
Greater New York Dental Meeting, Twenty-Fifth Anniversary	Dec. 5-9	New York	H. S. Horton Chm. Press & Publication	Rm. 106A, Hotel Statler, New York 1

*Examination for certification

UNIVERSITY OF MICHIGAN LIBRARIES

Name	Date	City	Secy. or Chmm.	Address
Maryland State Dental Association, Semi-Annual Meeting	Sept. 25-27	Hagerstown	E. L. Pessagno, Jr. Secy.	Medical Arts Bldg., Baltimore 1
Midcontinent Dental Congress, Ninth Annual Meeting	Nov. 27-30	St. Louis	J. E. Brophy Secy.	Syndicate Trust Bldg., St. Louis
National Association of Seventh-Day Adventist Dentists, Annual Meeting	Oct. 14-15	San Francisco	A. C. Koppel Secy.	437 Cedar St., N. W., Washington, D. C.
National Board of Dental Examiners	Dec. 5-6†		G. L. Teall Secy.	Box 71, Hiawatha, Kan.
New England Dental Society, Annual Meeting	Oct. 5-6	Boston	A. R. Wilson Secy.	43 Farmington Ave., Hartford
New Orleans Dental Conference, Second Annual Scientific Meeting	Nov. 13-16	New Orleans	New Orleans Dental Conference	8117 Oak St., New Orleans 18
Northeastern Society of Orthodontists	Nov. 28-29	New York	Oscar Jacobson Secy.	35 W. 81st St., New York
Southern Society of Orthodontists	Oct. 30-Nov. 1	New Orleans	F. P. Bowyer	608 Medical Arts Bldg., Knoxville, Tenn.
University of Buffalo Dental Alumni Association, Forty-Seventh Annual Meeting	Nov. 8-10	Buffalo	R. L. Montgomery Chm. Press & Publications	675 Delaware Ave., Buffalo

†Examinations (Part I and Part II) will be held in schools where there are five or more candidates